terraphase engineering

May 31, 2017

U.S. Environmental Protection Agency, Region 9
Water Enforcement Section II
75 Hawthorne Street (ENF 3-2)
San Francisco, CA 94105-3901

Attention: Juliet Hannafin

Subject: DRAFT Sediment Investigation Report
Sims Group USA Corporation, Redwood City, California

Dear Ms. Hannafin:

Terraphase Engineering Inc. is pleased to submit, on behalf of Sims Metal Management (Sims) the enclosed DRAFT *Sediment Investigation Report,* which describes the characterization of the marine sediment underneath and proximate to Sims' ship-loading conveyor located at Wharf 3 at the Port of Redwood City. This investigation has been completed in accordance with the Consent Decree between the United States Environmental Protection Agency and Sims Group USA Corporation, Case 3:14-cv-04209, effective December 1, 2014.

We look forward to discussing the findings with you. If you have any questions, please contact Peter Zawislanski at peter.zawislanski@terraphase.com or 510-645-1858, or Melisa Cohen at Melisa.Cohen@simsmm.com or 510-412-5307.

For Terraphase Engineering Inc.

Peter Zawislanski, PG, CHG
Principal Hydrogeologist

Jeff Wallace, PG
Principal Geologist

cc: Rich Campbell, EPA
Melisa Cohen, Sims Metal Management
Steven Shinn, Sims Metal Management
Scott Miller, Esq., Sims Metal Management
Margaret Rosegay, Esq., Pillsbury Winthrop Shaw Pittman

Enclosure: DRAFT *Sediment Investigation Report*, May 31, 2017

DRAFT

SEDIMENT INVESTIGATION REPORT
SIMS METAL MANAGEMENT
REDWOOD CITY, CALIFORNIA

Prepared for

Sims Group USA Corporation
699 Seaport Boulevard
Redwood City, California 94063

Prepared by

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May 31, 2017

Project Number 0012.001.008

terraphase engineering

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ACRONYMS AND ABBREVIATIONS

µg/kg	micrograms per kilogram
AWA	area-weighted average
COC	chain-of-custody
the Conveyor	Sims' ship-loading conveyor
EPA	Environmental Protection Agency
ERM	Effects Range Median
the Facility	Sims' metal recycling facility at the Port of Redwood City, San Mateo County, California
ft bss	feel below sediment surface
GPS	Global Positioning System
grab sampler	Petite Ponar grab sampler
HASP	Health and Safety Plan
HAZWOPER	Hazardous Waste Operations and Emergency Response
IDW	investigation-derived waste
LCS	laboratory control sample
Leviathan	Leviathan Environmental Services
mg/kg	milligrams per kilogram
NOAA	National Oceanic and Atmospheric Administration
NTE	not-to-exceed
PCB	polychlorinated biphenyl
the Port	Port of Redwood City
QA	quality assurance
QC	quality control
RPD	relative percent difference
RGs	remediation goals
RTC	response to comments
SFEI	San Francisco Estuary Institute
Sims	Sims Group USA Corporation

SSAP	Sediment Sampling and Analysis Plan
SSAP/QAPP	Sediment Sampling and Analysis Plan and Quality Assurance Project Plan
Terraphase	Terraphase Engineering Inc.
TWIC	Transportation Worker Identification Credentials
UCL	upper confidence limit
UTL	upper tolerance limit
USACE	United States Army Corps of Engineers
USCS	Unified Soil Classification System

CERTIFICATION

Information, conclusions, and recommendations in this document have been prepared by a California Professional Geologist.

DRAFT

Peter T. Zawislanski — Date
Principal Hydrogeologist
Professional Geologist (CA 7210)
Certified Hydrogeologist (CA 925)

DRAFT

Jeff Wallace — Date
Principal Geologist
Registered Geologist (OR G1288)

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SUBMITTAL CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Signature: D R A F T

Name: _____

Title: _____

Date: _____

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1.0 INTRODUCTION

1.1 Purpose

In accordance with Paragraph 12 of the Consent Decree between the United States Environmental Protection Agency (EPA) and Sims Group USA Corporation (Sims), Case 3:14-cv-04209, effective December 1, 2014 ("the Consent Decree"), Sims submitted, on March 1, 2015, for EPA's review and approval, a *Draft Sediment Sampling and Analysis Plan* (SSAP) to characterize the marine sediment within a portion of Redwood Creek to determine if the shared-use area underneath and proximate to Sims' ship-loading conveyor ("the Conveyor") located at Wharf 3 at the Port of Redwood City ("the Port"; Figures 1 and 2) has been affected by total metals and polychlorinated biphenyls (PCBs) associated with Sims' scrap metal ship-loading activities.

A *Revised Draft Sediment Sampling and Analysis Plan and Quality Assurance Project Plan* (SSAP/QAPP) was submitted to the EPA on January 22, 2016, in response to EPA comments provided in a letter dated October 8, 2015. The March 31, 2016, Final SSAP/QAPP addressed EPA comments presented in comment letters dated October 8, 2015, and March 17, 2016, and during in-person meetings between EPA, Sims, and Terraphase Engineering Inc. (Terraphase) representatives on December 14, 2015, and March 8, 2016. EPA approved the Final SSAP/QAPP on April 25, 2016.

Implementation of the Revised SSAP was undertaken in two phases of investigation. The first phase of investigation was conducted between June 6 and 15, 2016 ("the June 2016 investigation"). Following receipt and review of analytical results from this sampling event, Terraphase and Sims determined that additional sampling was warranted to fully characterize the Project Area at Wharf 3 near the Conveyor, (Figure 2) and to achieve the objectives of the Consent Decree. Interim results from the first phase of investigation were reported to the EPA in the *Interim Sediment Investigation Results and Proposed Additional Sediment Sampling* letter report, prepared by Terraphase and dated August 31, 2016 ("Interim Results Report"). On December 9, 2016, Terraphase prepared a response-to-comments (RTC) letter to address EPA comments on the Interim Results Report. The RTC letter identified the locations and depths for proposed additional sediment sampling, both in the background areas and in the Project Area. EPA approved the additional sampling on December 30, 2016.

The second phase of investigation, which implemented the December 9, 2016 proposal, was conducted between March 6 and 17, 2017 ("the March 2017 investigation"). This sampling event provided additional data to characterize lateral and vertical extents of potentially affected sediments, and to provide background data for the intertidal (riprap) area.

The comprehensive results of the field investigation activities and laboratory analyses pursuant to the Final SSAP/QAPP are presented herein.

1.2 Facility Description

Sims operates a metal recycling facility ("the Facility") located at the Port, in San Mateo County, California, immediately to the west of Seaport Boulevard as shown on Figure 1. At the Facility, Sims receives, sorts, separates, shreds, and stores bulk scrap metal (ferrous and nonferrous) for sale and export. These activities occur on a 13-acre parcel of land located east of a public right-of-way at the Port known as Herkner Road. The areas to the north and south of the Facility are occupied by a variety of other industrial tenants of the Port, some of which are engaged in industrial and bulk materials storage, handling, and shipping.

Sims and other unrelated bulk cargo operations conduct industrial ship-loading or unloading activities at Port-owned wharves located on the western side of Herkner Road, along the bank and shipping channel of Redwood Creek. Port facilities along the water include several ship-loading wharves, docks, and piers along the eastern shoreline of Redwood Creek. Bauxite, gypsum, and miscellaneous construction materials generally are unloaded from ships docked at the Port. Sims operates a Conveyor to deliver its scrap metal commodity (shredded specification-grade scrap steel) into the hulls of ships berthed at the Port-owned Wharf 3 located on the western side of Herkner Road. While Sims loads ships with scrap metal, bauxite and gypsum operators unload their commodities at Wharf 3.

The initial portion of the Conveyor is located on the Facility, but the remainder of the Conveyor spans Herkner Road and a concrete pier and apron located on pilings above the edge of Redwood Creek. The concrete apron is located directly beneath the Conveyor and extends from the shoreline to the edge of Wharf 3. The primary purpose of the apron is to catch material that may fall from the Conveyor during ship-loading operations. The concrete apron was installed in 1991 and was improved in 2002 to include additional screening material along the sides. As noted, other Port tenants use Wharf 3 (but not the Conveyor) for unloading bulk materials, including bauxite and gypsum.

1.3 Project Area

The Project Area in Redwood Creek is centered around the Sims Conveyor at Wharf 3, as shown on Figure 2. The Project Area was selected in conformance with the sampling protocol presented in the Consent Decree, which required investigation of "the area 50 feet to either side of the Conveyor, between the mean high tide line and Wharf 3." This area was defined in the Final SSAP/QAPP as the "primary area." This primary area is contained within the larger Project Area; the latter extends approximately 150 feet to the north and south of the Conveyor as shown on Figure 2. Based on the results from the June 2016 investigation, distribution of metals and PCBs in subtidal sediments justified a slight expansion of the areal extent of sediment sampling and additional subsurface sampling in the Project Area.

1.4 Objectives of the Sediment Investigation

The principal objective of the Final SSAP/QAPP was to characterize marine sediment in the vicinity of the Conveyor in accordance with the Consent Decree. The individual project objectives included:

- Visually assessing near-surface sediment in the vicinity of the Conveyor for evidence of scrap metal to establish the area of observed scrap metal impacts;
- Determining background concentrations of metals and PCBs in surficial sediments of Redwood Creek between Port wharves and the shoreline by sampling near-shore areas in the creek channel that are outside the Project Area; and
- Assessing the lateral extent of metals and PCBs in surficial sediments in the Project Area.

An additional objective, which was not identified in the Consent Decree but was added following discussions with EPA, was to assess the vertical extent of metals and PCBs in sediments in the Project Area.

1.5 Overview of Sediment Investigation Field Activities

Sediment samples were collected from the Project Area representing surface and subsurface sediments. Thirty-six sediment samples were collected from subtidal areas outside of, and at least 350 feet away from, the Project Area, to establish background concentrations of metals and PCBs. Furthermore, 18 surface samples were collected from background riprap areas to establish background concentrations of metals and PCBs specific to riprap areas. Fifty-eight locations were sampled in the Project Area, with 18 of those locations cored for multi-depth sample collection in addition to surficial grab samples.

Surface sediment samples were collected using a Ponar grab sampler, sediment cores were collected using a piston-corer or vibracore sampler, and sediment samples from the shoreline riprap area were manually collected using a stainless-steel spoon. Non-disposable equipment was decontaminated between samples. Sediment samples were visually examined for the presence of metal scrap. Sediment samples were individually homogenized and screened to remove coarse-fraction material prior to being submitted to the analytical laboratory.

1.6 Organization of this Document

The remainder of the Sediment Investigation Report is organized into the following sections.

Section 1.0 provides background information about the Facility, including location, operations, and an overview of the sediment investigation.

Section 2.0 provides a summary of the preparatory activities.

Section 3.0 discusses sediment sample collection activities and methods.

Section 4.0 provides the analytical methods.

Section 5.0 presents the field observations

Section 6.0 presents the analytical results.

Section 7.0 provides data evaluation.

Section 8.0 provides the field and laboratory quality control.

Section 9.0 provides laboratory data validation.

Section 10.0 presents a discussion of results.

Section 11.0 provides conclusions.

Section 12.0 provides a list of references used to develop this report.

2.0 PREPARATORY ACTIVITIES

The following sections discuss the preparatory activities that were conducted at the Facility prior to commencement of field investigation activities.

2.1 Notifications

Terraphase provided notifications to the San Francisco Regional Water Quality Control Board, Bay Conservation and Development Commission, and Redwood City prior to performing field investigation activities. Sims provided notification and project details to the Port.

2.2 Health and Safety Plan

Terraphase prepared a site-specific health and safety plan (HASP) prior to performing field investigative activities. All fieldwork was monitored according to the HASP to ensure that appropriate health and safety procedures were followed. A copy of the HASP was kept onsite during scheduled field investigation activities.

2.3 Special Training/Certification

Terraphase performed investigative activities in accordance with the Hazardous Waste Operations and Emergency Response (HAZWOPER) training requirements and other requirements in 29 CFR 1910.120(e). Transportation Worker Identification Credentials (TWIC) required for Port access were obtained prior to field investigation activities.

3.0 SEDIMENT SAMPLE COLLECTION

Sediment samples were collected in accordance with the approved Final SSAP/QAPP, the additional provisions of the Interim Results Report, and the RTC letter, between June 6 and June 15, 2016, and between March 6 and March 17, 2017. Leviathan Environmental Services (Leviathan) provided and operated the sampling vessel – a low-profile 28-foot aluminum, tunnel-hull boat – and the sample collection equipment. Locations W3-51 through W3-54 were accessed with a smaller vessel because the larger craft was unable to access these locations because of low clearance. Sediment samples were collected from the following areas (Figure 3):

- Wharf 2 – Background Subtidal and Riprap Sediment Samples
- Wharf 3 – Project Area Subtidal and Riprap Sediment Samples
- Wharf 4 – Background Subtidal and Riprap Sediment Samples
- Wharf 5 – Background Subtidal and Riprap Sediment Samples

Four sediment sample collection methods were used during the field investigation, including: (1) surface grab sampling using a Petite Ponar grab sampler, (2) surface and subsurface sampling using a manually operated piston-core sampler, (3) subsurface sampling using a vibracore sampler, and (4) direct manual collection of sediment from the riprap-covered shoreline using a spoon or trowel. These methods are further described below.

3.1 Project Area Sediment Samples

Sediment samples collected at the Wharf 3 Project Area included 18 sediment cores advanced to a target minimum depth of approximately 5 feet below sediment surface (ft bss), and 17 surface sample locations, as shown on Figure 4. Between one and six samples were retained from each sampling location, for a total number of 104 subtidal samples which were submitted to the analytical lab. An additional 23 riprap surficial samples were collected from the Wharf 3 Project Area and submitted for analysis. A total of 16 samples were collected from the deepest 1 foot of recovered sediment cores during the March 2017 sampling. These deep (i.e., below 5 ft bss) samples were placed on hold at the laboratory.

3.2 Background Sediment Samples

Background samples were collected from areas outside of the Project Area to represent Redwood Creek background conditions. Background sediment samples were collected at Wharves 2, 4, and 5, at locations shown on Figures 5a, 5b, and 5c, respectively. Surface and subsurface sediment samples were collected from 48 locations in the three background areas. Background locations along Wharves 4 and 5 are approximately 350 feet and 1,000 feet upgradient of the Project Area; the background location along Wharf 2 is approximately 400 feet downgradient of the Project Area. At each background area, one sediment core location to 3 ft bss (two subsurface samples per core), nine surface sediment locations, and six surficial riprap

locations were sampled. In total, 54 background sediment samples were collected for laboratory analysis.

3.3 Sample Collection and On-Board Sample Processing and Methods

Sediment samples were examined, photographed, sieved, and processed on the sampling vessel, as described below. The physical characteristics of each sediment sample or core collected were examined and noted on the individual sediment sample logs, which are presented in Appendix A. Photo logs illustrating the sampling procedures and examples of encountered sediments are presented in Appendix B.

Sediment samples were placed in laboratory-supplied containers. Sample containers were labeled, logged on chain-of-custody (COC) forms, and placed in an ice-chilled cooler for transport to a California-certified laboratory for analysis following COC protocols. Sample containers were labeled to include the project name, sample identification (location and depth interval), date and time of sample collection, requested analyses, and sampler's initials.

3.3.1 Petite Ponar Sample Collection

A Petite Ponar grab sampler ("grab sampler") was deployed from the sampling vessel and, in certain locations, directly from Wharf 3, to collect surface sediment at Project Area and background locations, as shown on Figure 4 and Figures 5a through 5c. The grab sampler was decontaminated prior to use at each sampling location. The grab sampler was positioned outboard of the vessel and lowered through the water column at a rate no faster than 1 foot per second. Upon contact with the top of the sediment, the grab sampler's spring-action pin was unweighted and released. The lowering line was slowly pulled taut, closing the grab sampler and trapping sediment. The grab sampler was slowly pulled out of the water and any overlying water within the grab sampler was drained through the top screens prior to opening.

The grab sampler was opened and the sediment was transferred to a decontaminated stainless-steel bowl. If the sediment volume was deemed insufficient, the grab sampler was rinsed in bay water and the sampling process repeated at the same location. Any remaining overlying water was siphoned off with a decontaminated plastic bulb baster, with care taken not to siphon off sediment. The sediment sample was then processed in the same manner as other sample collection methods, as described in Section 3.3.4, below.

3.3.2 Core Sample Collection

Sediment cores were collected using with either a piston-core sampler or a vibracore sampler. The piston-core sampler was advanced by manually pushing a disposable 4-inch-diameter core barrel into the sediment. As needed, a slide hammer was used to advance the core to the target sample depth of 36 inches. The piston core was used during the June 2016 sampling event, and

at one location in March 2017 (location 52). The vibracore was used during the March 2017 sampling event to achieve greater sampling depths compared to the piston core sampler.

The vibracore sampler has a powered vibratory assembly at the head of a 10-foot-long aluminum core barrel and a removable drive head with a core catcher. A disposable polyethylene core collection sleeve was placed into the core barrel before the sampler was advanced. The weight and action of the vibracore head assembly advanced the core barrel into the sediment up to 10 ft bss. The sediment column penetrated in the Project Area generally consists of soft sediment. Normal compaction of the sediment core occurs as the core barrel is extracted by the vibratory action. As a result, the observed sediment core lengths were typically 8 to 9 feet.

Once retrieved, the sediment cores were inspected to assess whether sufficient sediment was retained in the core barrel pursuant to the approved Final SSAP/QAPP. If the core recovery was satisfactory, the core liner was cut open and sample processing was conducted in the same manner as other sample collection methods, as described in Section 3.3.4, below. If refusal was encountered prior to reaching the target depth for that core location, up to three attempts were made to advance the core to the desired depth. For each attempt, if needed, the vessel was repositioned within a few feet of the original location before the core barrel was advanced.

Following core retrieval, the sediment core was cut into sections representing the target depths for sample processing. Sample depth intervals were adjusted based on sediment core recovery. In general, targeted sample depths for sediment cores are shown in the table below. Actual sample depths are shown on Tables 2, 4, and 6a/6b.

Target Sample Intervals (ft bss)	Location
0.0-0.5 (surface)	Project Area, background
1.5-2.0	Project Area, background
2.5-3.0	Project Area, background
3.5-4.0	Project Area
4.5-5.0	Project Area
Bottom 0.5- to-1.0-foot section of core (archived)	Project Area

3.3.3 Manual Grab Sediment Sample Collection

Manual grab sediment samples were collected by field personnel on foot along the riprap near the shoreline at Project Area and background locations, to a maximum depth of approximately

6 inches below the sediment surface. The surface sediment samples were manually collected during low tide when the sediment was exposed. Intertidal riprap sample locations are below the Mean High Water Line, as confirmed by a survey conducted by a licensed surveyor, and shown on Figures 4 and 5a through 5c. Sediment samples were collected with a decontaminated stainless-steel spoon and bowl at riprap locations (Figure 4). Following collection, sample processing was conducted in the same manner as other sample collection methods, as described in Section 3.3.4, below.

3.3.4 Sample Processing

Provided that the sample recovery was sufficient, the sediment was inspected, measured, and photographed. Each grab or core sample was placed into a decontaminated stainless-steel bowl and transferred to the sampling vessel and then homogenized. The homogenized sample was placed into a decontaminated stainless-steel, 1/8-inch sieve tray, and screened into a decontaminated stainless-steel bowl. The sample was then placed into a laboratory-supplied container. Each individual sample was assigned a unique alphanumeric identifier, as described in the Final SSAP/QAPP. Samples were stored on ice in insulated coolers while aboard the vessel and during transportation to the laboratory. Material larger than 1/8 inch was screened from the sample and was rinsed, described, containerized, and generally retained for archive.

During the June 2016 sampling event, material retained on the sieve from some of the grab samples was disposed of as investigation-derived waste (IDW). The disposal of this material as IDW was a deviation from the April 25, 2016, EPA approval letter. This deviation was due to a miscommunication with the field staff, and was uniformly corrected during the March 2017 field program, when all material that did not pass the sieve was retained.

3.4 Global Positioning System

Final sample locations were documented using a Trimble® GeoXH 6000 handheld Global Positioning System (GPS) device with sub-meter accuracy. GPS coordinates for all samples are presented in Table 1. Proposed sample location coordinates were uploaded into the GPS unit prior to field investigation activities. Terraphase field personnel used the GPS unit to navigate to each proposed sample location. Field location coordinates were recorded in the GPS unit after sample collection and processing. Some of the field sample locations had to be adjusted relative to the proposed locations due to either refusal or access issues, or slight movement of the vessel during maneuvering and positioning with multiple anchors and lines.

3.5 Field Equipment Decontamination Procedure

Stainless-steel equipment was used during sediment sampling, including spoons, scrapers, bowls, sieve trays, and the cutter head assembly of the vibracore. All equipment used for sampling was properly decontaminated between sample locations to prevent cross-

contamination between samples. Liquinox®, deionized water, and a 10-percent nitric-acid solution were used to decontaminate the sampling equipment. The decontamination process included the following steps:

1. Wash the equipment with Liquinox® and water solution.
2. Rinse with deionized water.
3. Wipe the equipment with a clean paper towel.
4. Rinse with a 10-percent nitric acid solution.
5. Rinse with deionized water.
6. Wipe the equipment with clean paper towel.

Any sampling equipment that could not be properly cleaned was not used for subsequent sampling activities.

3.6 Investigation-Derived Waste

IDW, including excess sediment and decontamination fluids, was temporarily stored at the Facility in 55-gallon drums and handled in accordance with state and federal requirements, pending waste characterization. The 55-gallon drums were properly labeled and included description of waste, date generated, contact information, and project name.

Composite samples of the IDW were collected into laboratory-supplied, properly labeled containers, placed in an ice-chilled chest, and submitted to an analytical laboratory for chemical analyses. The analytical results were evaluated to determine the waste classification for disposal purposes. IDW from the June 2016 event was disposed of by Sims; IDW from the March 2017 event is pending profiling and transportation to appropriate waste disposal facilities, in a manner consistent with U.S. Department of Transportation regulations.

Disposable personal protective equipment, used polyethylene core barrels, paper towels, and similar sampling materials, were managed as nonhazardous solid waste. These wastes were placed into plastic bags and transferred to an onsite industrial waste container, the contents of which are routinely disposed of in a municipal landfill.

3.7 Chain-of-Custody Protocol

Sediment sample processing was tracked using COC forms. The COC forms are included in the laboratory reports provided in Appendix C. For each sample that was submitted for laboratory analysis, an entry was made on a COC form. COCs were prepared for groups of samples collected during each field day. Original COCs accompanied each shipment of samples to the laboratory.

3.8 Sample Shipping

Samples were placed in an ice-chilled cooler for transport to the laboratory for analysis. The laboratory was notified in advance of sample shipments. Upon receipt of the samples, the Laboratory Quality Assurance (QA) Officer immediately notified the Project QA/Quality Control (QC) Officer if conditions or problems were identified that require immediate resolution. Such conditions included container breakage, missing or improper COC, exceeded holding times, missing or illegible sample labeling, or temperature excursions.

4.0 ANALYTICAL METHODS

Sediment samples collected during this field investigation were submitted to Eurofins Laboratory, an analytical laboratory certified by the California Department of Health Services through the Environmental Laboratory Accreditation Program. Based on the initial results of the June 2016 investigation, and in accordance with the SSAP/QAPP, Sims elected to analyze all contingency sediment samples that had been placed on hold at the laboratory. Contingency samples collected from the bottom 0.5- to-1.0-foot section of core during the March 2017 event were not analyzed.

Sediment samples and aqueous equipment blanks were analyzed as follows:

Sediment

- California Title-22 Metals by U.S. EPA Method 6010B
- Mercury by U.S. EPA Method 7470A/7471A
- Iron and Aluminum by U.S. EPA Method 6010B
- PCB Aroclors by EPA Method 8082A
- Moisture Content by ASTM D-2216

Aqueous

- California Title-22 Metals by U.S. EPA Method 6010B
- Mercury by U.S. EPA Method 7470A/7471A
- Iron and Aluminum by U.S. EPA Method 6010B
- PCB Aroclors by EPA Method 8082A

Composite samples of the sediment IDW and a grab sample of the aqueous IDW (decontamination water) were collected and submitted to Eurofins Laboratory. Samples were analyzed for the same media-specific constituents listed above. The IDW analytical results were evaluated to determine the waste classification for disposal purposes.

5.0 FIELD OBSERVATIONS

5.1 Sediment Classification

Sediment sample logs are presented in Appendix A. Sediments were described using general guidelines of the Unified Soil Classification System (USCS), as appropriate. The sediment in both the Project Area and the background areas consisted predominantly of silt and clay, with minor amounts of sand and gravel. Trace amounts of shell fragments were commonly observed in the surficial and shallow-depth core samples. The sediment was generally homogenous in nature, with relatively uniform coloration, grain size distribution, and consistency. The majority of sediments encountered were dark gray to black, silt to clayey silt, soft to medium stiff, wet to saturated, and moderately plastic. No significant stratification (i.e., sand lenses or other natural lithologic boundaries) was noted during coring activities. Sediments were characterized by an organic odor typical of reduced marine sediments.

Some of the sediment samples collected in the Project Area contained trace amounts of metal fragments, fabric, rubber, glass and plastic debris, and oxidized bauxite balls. These materials were photo-documented and described in sediment logs when encountered. Further discussion of observed non-native materials is presented below.

5.2 Visible Observations of Scrap Metal

The presence of scrap metal in the sediment samples was visually evaluated in the field during sample processing (i.e., sieving). Small amounts of scrap metal were observed in sediment from 18 sample locations of the total 58 locations sampled in the Project Area. The locations where scrap metal was observed are shown on Figure 6. Scrap metal included copper wire, other metallic wire, miscellaneous metal hardware (screws, nails, washers) and metal pieces up to 1 to 2 inches in maximum dimension. Photo logs of various materials sieved from the sediment samples are presented in Appendix B.

Most of the locations where scrap metal was observed were limited to an area within 50 feet of the concrete apron. Scrap metal was observed in one sample location greater than 50 feet south of the concrete apron (surface sample location 55). Scrap metal was observed in four samples greater than 50 feet north of the concrete apron (surface sample locations 46 and 51; core sample locations 49 and 50), as shown on Figure 6.

At seven coring locations (5, 6, 7, 41, 43, 44, and 47), at approximately 1.5 to 2 ft bss, a semi-consolidated interval was encountered during vibracore advancement which slowed the penetration rate. The driller was able to advance the vibracore to the targeted sample depth at all of these locations except for location W3-43, where refusal was encountered three times at a maximum depth of 3 feet. Based on visual examination of the sediment cores, the interval corresponding to this relatively dense interval consisted of gravel-sized particles with trace

amounts of non-native materials such as synthetic fiber, metal fragments, and copper wire. These materials formed a dense, weakly agglomerated, friable mass that could be disarticulated under finger pressure. The material was degraded and corroded. These characteristics, along with its depth, suggests that this material likely represents historical deposition. No evidence of a widespread agglomerated metal mass was observed or evidenced by the drilling action of the vibracore, or the observations of recovered sediment cores. Photo logs included as Appendix B further document this material from various core locations.

6.0 ANALYTICAL RESULTS

Sediment samples were analyzed for the constituents listed in Section 4. The laboratory analytical reports for Project Area and background samples are presented in Appendix C. Analytical results are summarized below.

6.1 Background Sediment Sample Results

Analytical results for the background sediment samples are presented in Tables 2 and 4. Concentrations of copper, lead, and zinc in surface background sediment samples (both subtidal and riprap) are shown on Figures 7a, 7b, and 7c, for Wharves 2, 4, and 5, respectively. Concentrations of total PCB Aroclors for these samples are shown on Figures 8a, 8b, and 8c, for Wharves 2, 4, and 5, respectively.

Background sediment sample results were evaluated statistically to calculate the minimum, maximum, mean, standard deviation, the 95 percent upper confidence limit on the mean (95%UCL), and the 95 percent upper tolerance limit on the mean (95%UTL) for each metal and for total PCB Aroclors. The 95%UCL and 95%UTL were calculated using ProUCL, U.S. EPA's statistical package. Separate statistical evaluations were performed for subtidal background and riprap background samples because the metal and PCB data from the riprap samples were confirmed to be a statistically different population than the subtidal sample data based on the Gehan-Breslow and Tarone-Ware nonparametric tests. The results of the statistical evaluation of the background sediment data are presented in Tables 3 and 5.

Not all statistical parameters could be calculated for all metals because of, in some cases, a large number of non-detects. For example, there were too few detections of antimony (subtidal and riprap), selenium (subtidal), and thallium (subtidal and riprap) to calculate a 95%UCL or 95%UTL for these metals (Tables 3 and 5).

The 95%UCL and 95%UTL values, which are highlighted in Tables 2 and 4, for the three combined background areas, were used to compare to Project Area data, as discussed in Section 7, and presented on Tables 6a and 6b. Subtidal and riprap samples from the Project Area were screened against the respective 95%UCLs and 95%UTLs for background subtidal and riprap sample types.

Gravimetric moisture content analysis was performed and reported on a dry-weight basis. Moisture content in the background sediment samples ranged from 45% to 69% in subtidal samples and from 34% to 69% in the riprap samples.

6.2 Project Area Sediment Sample Results

Analytical results for the Project Area sediment samples are presented in Tables 6a and 6b.

Project Area sediment sample results were evaluated statistically to calculate the minimum, maximum, mean, and standard deviation, the 95%UCL, and the 95% UTL for each metal and for total PCB Aroclors in riprap and subtidal sample locations. The results of the statistical evaluations of the Project Area sediment data are presented in Tables 7a and 7b. Gravimetric moisture content analysis was performed and reported on a dry-weight basis. Moisture content in the Project Area samples ranged from 46% to 70% in subtidal samples, and from 29% to 67% in riprap samples (Tables 6a and 6b).

7.0 DATA EVALUATION

Concentration of metals and total PCBs in Project Area sediments were compared with their respective background concentrations, as follows:

- Riprap data from the Project Area were compared to 95%UTLs of background riprap data.
- Subtidal data from the Project Area (surficial and subsurface) were compared to 95%UTLs of background subtidal data.

7.1 Project Area Concentrations vs. Background 95%UTLs

The concentrations of each metal and total PCBs in each Primary Area sediment sample were compared with the 95%UTL maximum concentration for the respective analyte in the background data set (Tables 6a and 6b). The copper, lead, zinc, iron, and total PCBs results in subtidal surface sediment are presented on Figures 9, 10, 11, 12, and 13, respectively; locations that exceeded the 95%UTL are indicated on the figures. Depth-discrete concentrations of copper, lead, zinc, iron, and total PCBs in samples from sediment cores are presented on Figures 14, 15, 16, 17, and 18, respectively. These four metals and total PCBs were selected for discussion because they had the most frequent exceedances relative to the background 95%UTLs.

7.1.1 Metals in Subtidal Sediment

Copper concentrations exceeded their 95%UTL background concentration in 15 out of 35 subtidal surficial sediment samples (Figure 9) and 43 out of all 104 subtidal sediment samples (Figure 14).

Lead concentrations exceeded their 95%UTL background concentration in 20 out of 35 subtidal surficial sediment samples (Figure 10) and in 70 out of all 104 subtidal sediment samples (Figure 15).

Zinc concentrations exceeded their 95%UTL background concentration in 27 of the 35 subtidal surficial sediment samples (Figure 11) and in 68 out of all 104 subtidal sediment samples (Figure 16).

Iron concentrations exceeded their 95%UTL background concentration in 9 of the 35 subtidal surficial sediment samples (Figure 12) and in 37 out of all 104 subtidal sediment samples (Figure 17).

7.1.2 Total PCBs in Subtidal Sediment

Total PCB concentrations exceeded their 95%UTL background concentration in 8 out of the 35 subtidal surficial sediment samples (Figure 13) and in 37 out of all 104 subtidal sediment samples (Figure 18).

7.1.3 Metals in Riprap Sediment

Copper concentrations exceeded their 95%UTL background concentration in 20 out of 23 riprap sediment samples (Figure 9).

Lead concentrations exceeded their 95%UTL background concentration in 16 out of 23 riprap sediment samples (Figure 10).

Zinc concentrations exceeded their 95%UTL background concentration in 19 out of 23 riprap sediment samples (Figure 11).

Iron concentrations exceeded their 95%UTL background concentration in 16 out of 23 riprap sediment samples (Figure 12).

7.1.4 Total PCBs in Riprap Sediment

Total PCB concentrations exceeded their 95%UTL background concentration in 16 out of 23 riprap sediment samples (Figure 13).

7.2 Spatial Distribution of Metals in the Project Area

Concentrations of metals were highest in subtidal sediment in close proximity to the concrete apron, and along the intertidal riprap shoreline on either side of the concrete apron. Concentrations of metals in subtidal sediment generally decreased with distance from the concrete apron, both to the south and north. Vertical distribution of metals in core samples (collected up to 5.0 ft bss) generally exhibited the highest concentrations in the upper 2 to 3 feet of sediment, with decreasing concentration trends to total depth. Core locations in close proximity to the apron generally had higher detections at depth than distal core locations. Project Area riprap samples exhibited overall higher concentrations of metals than Project Area subtidal samples, which is consistent with the trend observed in the background areas.

Concentrations of iron in both riprap and subtidal sediments decrease with distance from the concrete apron and conveyor. Iron concentrations in surficial subtidal sediment decrease to below the background 95%UTL within approximately 50 feet of the concrete apron. Iron concentrations in riprap sediment decrease to below the background 95%UTL within approximately 100 feet of the concrete apron.

7.3 Spatial Distribution of PCBs in the Project Area

Similar to metals, concentrations of PCBs were highest in subtidal sediment in close proximity to the concrete apron and along the intertidal riprap shoreline on either side of the concrete apron. Concentrations of PCBs in subtidal sediment generally decreased with distance from the concrete apron, both to the south and north. Lateral distribution of PCBs in exceedance of background 95%UTL is overall less widespread compared to lateral distribution of metals exceedances. Project Area riprap samples exhibited overall higher concentrations of PCBs than Project Area subtidal samples, which is consistent with the trend observed in background areas.

Of the 18 cores advanced in the Project Area, all but one were advanced to at least the target depth of 5 ft bss. Of the 17 samples analyzed from 5 ft bss – the maximum depth from which analytical data were obtained – six samples contained total PCBs below the method detection limit for PCBs, five were below the background subtidal 95%UCL, and two were between the 95%UCL and the 95%UTL. Four samples from this depth had PCBs detected above the 95%UTL; however, all were below 500 micrograms per kilogram (µg/kg), and data from other samples in these cores clearly indicate a decreasing concentration trend with depth.

The vertical distribution of total PCBs in core samples indicates that the highest concentrations occur in the 1.5-to-2-foot depth, with decreasing concentration trends to total depth, and lower concentrations at the surface. Total PCB concentrations were higher in subsurface sediment from locations in close proximity to the apron than in distal core locations (i.e., at locations more than 50 feet from the Conveyor).

7.4 Comparison of PCB Data to Reference-Area PCB Data

The Project Area subtidal PCB data were also compared with subtidal PCB data from three documented sources:

- 2014 PCB data collected as part of the Redwood City Navigation Improvement Feasibility and Integrated Environmental Impact Statement/Environment Impact Report ("the 2014 Redwood Creek data"; USACE 2015), at locations not shown in USACE 2015;
- Unpublished 2015 PCB data collected for the Redwood City Navigation Improvement Project, provided by EPA staff during a meeting with Sims and Terraphase representatives on March 8, 2016 ("the 2015 Redwood Creek data"); and
- San Francisco Estuary Institute (SFEI) ambient PCB concentrations for San Francisco Bay Area sediments calculated from data collected between 2002 and 2003, and between 2007 and 2014 (SFEI 2016).

A statistical summary of these reference-area PCB data is presented in Table 8.

Total PCB concentrations from the 2014 and 2015 Redwood Creek data were calculated as the sum of concentrations of 40 selected PCB congeners, for samples collected from 12 locations shown on Figure 3. The total PCB concentrations in Redwood Creek sediment collected in 2014 and 2015 ranged from 1.22 to 356 µg/kg, with 95%UCLs ranging from 17.39 to 197 µg/kg. By comparison, the background-area total PCB 95%UCL concentrations for subtidal sediments from the Wharf 2, 4, and 5 areas were 157.1 µg/kg, with a maximum total PCB concentration of 452 µg/kg. Therefore, the range of total PCB concentrations found in the site-specific background areas was similar to the range found in sediment from reference locations in Redwood Creek.

The median total PCB concentration in Project Area subtidal surficial and subsurface sediment samples was within the range of total PCB concentrations in the Redwood Creek reference samples. This indicates that over half of the samples had concentrations within the range of concentrations found in Redwood Creek Reference samples. However, the maximum and mean concentrations of total PCBs in the Project Area were above the maximum concentration from the Redwood Creek dataset.

All total PCB concentrations in the Project Area subtidal surface sediment samples were above the SFEI ambient total PCB concentrations, except for 11 samples which were below detection limits for all PCBs. Most total PCB concentrations in subtidal sediment samples from the background areas were also above the SFEI ambient total PCB concentrations based on the 90% upper tolerance limits of the 90^{th} and 99^{th} percentile concentrations.

8.0 QUALITY CONTROL

The laboratory analyses were performed according to analytical methods, detection limits, and QA/QC procedures described in the SSAP/QAPP.

8.1 Data Verification

Data collected were subjected to the data verification process, which includes proofreading and editing hard copy data reports to ensure that data correctly represent the analytical measurement. In general, verification identifies non-technical errors in the data package that can be corrected (e.g., typographical errors). Data verification also includes verifying that the sample identifiers on laboratory reports (hard copy) match those on the COC record.

8.2 Field Quality Control Samples

Field QC samples were collected and analyzed, including sixteen equipment blanks and two field blanks.

8.3 Laboratory Quality Control Samples

Laboratory QC samples are used to verify that procedures, such as sample handling, storage, and preparation, are not introducing variables into the process that could render the validity of samples questionable, and assess data quality in terms of precision and accuracy.

Laboratory QC samples were accomplished by analyzing initial and continuing calibration samples, method blanks, laboratory control samples (LCSs), surrogate spikes, matrix spikes, and laboratory duplicate samples. Results are included in the QC package for each laboratory analytical report presented in Appendix C.

9.0 LABORATORY DATA VALIDATION

Analytical data were reviewed and data validation reports are presented in Appendix D. Analytical data were reviewed in general accordance with the principles for data validation presented in the U.S. EPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review (U.S. EPA 2014a) and the U.S. EPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review (U.S. EPA 2014b). The data were reviewed to evaluate potential impact on data quality in the areas of data completeness, analytical holding times and sample preservation, field and laboratory blank samples, LCSs, matrix spike/matrix spike duplicate samples, surrogate compound recovery, and compound quantitation.

9.1 Quality Control Evaluation of the Analytical Data

This section presents the results of the evaluation of both field and laboratory QC checks. The evaluation of the validated data sets compared the targeted data results versus the actual data results through the use of precision, accuracy, representativeness, completeness, and comparability parameters.

9.1.1 Field Quality Control Sample Checks

All field QC sample results (equipment blanks and field blanks) were reviewed. Some contaminants were detected in the equipment blank and field blank samples. Refer to the data validation reports in Appendix D for detailed descriptions of target compounds.

9.1.2 Laboratory Quality Control Sample Checks

The procedures in this section are designed to assess QC data for blanks, duplicates, spikes, and surrogates. The review of these data provides information concerning the precision and accuracy of measurements conducted by the laboratories and field procedures.

9.1.2.1 Laboratory Method Blanks

The laboratory method blank samples had some detections of target compounds. Refer to the data validation reports in Appendix D for detailed descriptions of target compounds.

9.1.2.2 Laboratory Control Samples

All percent recovery values for LCSs were within acceptable criteria established by the laboratory for the respective testing methods except aluminum (batch 160610L03), antimony (batch 170324LA4), and Aroclor-1016 (batch 170310L02), which were outside control limits, but laboratory recovery percentage is within the marginal exceedance control limit range (+/- 4 standard deviation from the mean).

9.1.2.3 Surrogate Compound Recovery

Some surrogate compounds were above and outside control limits because of required sample dilution and matrix interference. The associated method blank surrogate spike compound was in control, and therefore, the sample data were reported without further clarification. Results for all other surrogate compounds that were prepared and analyzed by the laboratory were within control limits.

9.1.2.4 Matrix Spike/Matrix Spike Duplicates

In several of the QC batches, matrix spike and/or matrix spike duplicates compounds were out of control limits because of suspected matrix interference. In some post-digestive spikes, the spike recovery and relative percent difference (RPD) control limits do not apply, resulting from the parameter concentration in the sample exceeding the spike concentration by a factor of four or greater. All other percent recoveries and RPDs for matrix spikes, matrix spike duplicates, and post-digestive spikes were within acceptable criteria established by the laboratory for the respective testing methods.

9.1.2.5 Sample Duplicates

All percent recoveries and RPDs for sample duplicates were within acceptable criteria established by the laboratory for the respective testing methods.

9.1.3 Representativeness

Representativeness is the reliability with which a measurement or measurement system reflects the true conditions under investigation (U.S. EPA 2014a, b). Representativeness is influenced by the number and location of the sampling points, sampling timing and frequency of monitoring efforts, and the field and laboratory sampling procedures.

The representativeness of data was enhanced by the use of established field and laboratory procedures and their consistent application. Samples that were collected are considered to be representative of the location of sample collection.

9.1.4 Completeness

The completeness of the data is described as a ratio of the amount of data expected from the field program versus the amount of valid data received. Valid data are considered to be those data that have not been rejected (were not R-qualified) either from data validation or internal data review. Completeness can be expressed as the percentage of valid results relative to the total number of requested results.

Based on the data validation reports, none of the results was rejected in the sampling event. The completeness of the sample sets submitted for analysis is 100%, which is above the completeness goal of 90% set for this project.

9.1.5 Comparability

Comparability evaluates whether the reported data are comparable with similar data reported by other organizations. The comparability of the laboratory results was found to be acceptable. All units were consistent and appropriate for the matrix sampled.

9.1.6 Sensitivity

Sensitivity is essentially the lowest detection limit of the method or instruments for each of the measurement parameters of interest. Technically, it is the capability of a method or instrument to discriminate between measurement responses representing different levels of the variable of interest.

The analytical laboratory determined the minimum concentration (i.e., method detection limit, instrument detection limit, analytical reporting limit) per laboratory certification requirements set forth by the California Department of Health Services. The lowest technically feasible reporting limits were used for the analytical methods.

10.0 DISCUSSION

Results of analytical testing and field observations from sediment sampling activities conducted between June 2016 and March 2017 are presented in the sections above. This section provides an overview discussion of the investigation results, and presents our current understanding of site conditions based on both phases of work. Field observations of metal and other non-native materials that are potentially related to Sims' activities (presented in Section 5), as well as the analytical results of sediment testing (presented in Section 6), are both critical to achieving the site characterization objective. These are both summarized and discussed below.

10.1 Discussion of Field Observations

Trace amounts of visible metal were observed in 18 out of 58 Project Area sample locations. Most of the locations where scrap metal was observed were in close proximity to the concrete apron (i.e., the Conveyor) or to Wharf 3. The metal fragments observed in samples collected near the concrete apron are likely related to scrap-metal-loading operations. However, the metal observed in locations more than 40 feet away from the concrete apron may be due to other industrial activities which take place on Wharf 3. Identified metal fragments were generally quite small, less than 2 inches in maximum dimension, and were sparsely distributed through the upper section of the sediment cores. Some increase in density was noted based on vibracore penetration rate in the area near the concrete apron; however, no material which can be interpreted to consist of an indurated metal mass was observed.

10.2 Discussion of Analytical Results

Sediment sampling was conducted at Wharves 2, 4, and 5, to provide a project-specific background data set against which to statistically evaluate Project Area data. All Project Area data were screened against background 95%UTLs to characterize extent and distribution of elevated metals and PCBs concentrations in subtidal and riprap sediments.

The metals and PCB concentrations in riprap sediment samples collected in the Project Area were typically higher than in the subtidal sediment. This trend was also observed in all three of the background areas. In the Project Area riprap samples, the concentrations of metals and PCBs were highest adjacent to the concrete apron; a significant decrease is generally observed at a distance of 50 ft to 75 ft in each direction, north and south of the apron. Nonetheless, total PCBs detected in the two riprap samples furthest from the apron in both the north and south directions (approximately 100 ft) were higher than the 95%UTL PCB background concentration of 1,211 µg/kg, with a total PCB concentration in the southern-most sample (W3-18) of 2,360 µg/kg, and a total PCB concentration in the northern-most sample (W3-31) of 1,390 µg/kg. The

collection of one additional riprap sediment sample beyond these two locations would improve the understanding of the lateral distribution of PCBs in the Project Area riprap sediment.

Concentrations of metals and PCBs in Project-Area sediments were found to generally decrease with distance from the concrete apron and with increasing depth. The observed concentration trends indicate that the lateral distribution of metals and PCBs in subtidal sediments is adequately characterized in the Project Area.

Concentrations of both metals and PCBs in Project Area core samples were almost uniformly highest in the 1.5 to 3.0 ft bss depth interval. Despite the 95%UTL exceedances for some metals and total PCBs in samples from the 5 ft bss (i.e., deepest analyzed) depth from several core locations, particularly in close proximity to the Conveyor, adequate vertical characterization has been achieved to meet the objectives of this investigation.

11.0 CONCLUSIONS

This report presents results of an investigation of marine sediments conducted by Terraphase at the Sims facility between June 2016 and March 2017. The investigation was conducted in accordance with the Consent Decree, the approved SSAP/QAPP, and was designed to determine whether marine sediments in the Project Area have been affected by total metals and PCBs potentially associated with Sims' scrap metal ship-loading activities. During the two phases of investigation, sediment samples were collected throughout the Project Area, and in three background areas (Wharves 2, 4, and 5). Surficial and subsurface subtidal samples collected from up to 5 feet bss, along with surficial samples from the intertidal zone along the riprap-armored shoreline, were analyzed for metals and PCBs.

A total of 181 discrete sediment samples were submitted for chemical analysis for 19 individual metals, and PCB Aroclors. The resulting data set was statistically evaluated to develop Site-specific background concentrations for the analytes, and to compare such background concentrations with the Project-Area analytical results. The quantity and distribution of sample locations in the Project Area was sufficient to characterize the extent of metals and PCBs, as required by the Consent Order. The analytical data, in conjunction with the field observations, demonstrate that elevated metals and PCBs are generally limited to shallow sediments in the "primary area", i.e., within approximately 50 feet laterally of the Conveyor.

Scrap metal and other non-native materials were found in de minimis quantities. A pervasive agglomerated metal mass was not observed in the subsurface sediment cores. Based on the relative ease in advancing the vibracore device, even in close proximity to the Conveyor, we conclude that indurated metal is not present in the subtidal area.

The results of this investigation provide sufficient information on the nature and extent of subtidal sediment quality in the Project Area to assess the environmental risk posed by metals and PCBs, and/or to evaluate the potential need for remediation. Although some of the peripheral subtidal sediment samples contained lead and zinc at concentrations above their respective background 95%UTLs, these exceedances were minor, at 10 to 20% above the 95%UTL. PCB concentrations in the peripheral subtidal samples were all below the background 95%UTL. Total PCB concentrations in four of the 4.5-to-5-ft-bgs samples slightly exceeded the background 95%UTL; total PCB concentrations ranged from 400 to 490 µg/kg as compared with the 95%UTL of 395 µg/kg. Furthermore, metals and total PCB concentrations along the periphery of the Project Area were within or below the likely range of potential clean-up goals (National Research Council 2007). Therefore, no additional sediment investigations in the subtidal area are recommended.

Similar to the subtidal sediment quality, a significant decrease in the concentration of metals and total PCBs is observed in the riprap sediment data with increasing distance away from the concrete apron and conveyor. However, the collection of one additional riprap sediment sample

beyond furthest locations to the north and south is recommended to improve the understanding of the lateral distribution of metals and PCBs in the Project Area riprap sediment.

12.0 REFERENCES

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TABLES

Table 1
Sampling Location Coordinates
Sediment Investigation Report
Sims Metal Management, Redwood City, California

terraphase engineering

Area	Sample Location	Actual (June 2016)		Actual (March 2017)	
		Northing	Easting	Northing	Easting
Wharf 2	W2-01	2013557.345	6065544.855	n/a	n/a
	W2-02	2013548.350	6065565.102	n/a	n/a
	W2-03	2013542.937	6065581.341	n/a	n/a
	W2-04	2013584.781	6065530.965	n/a	n/a
	W2-05	2013576.749	6065552.681	n/a	n/a
	W2-06	2013568.318	6065575.186	n/a	n/a
	W2-07	2013562.432	6065591.087	n/a	n/a
	W2-08	2013603.333	6065568.302	n/a	n/a
	W2-09	2013589.987	6065586.090	n/a	n/a
	W2-10	2013580.830	6065599.254	n/a	n/a
	W2-11	n/a	n/a	2013534.326	6065594.231
	W2-12	n/a	n/a	2013532.238	6065605.847
	W2-13	n/a	n/a	2013558.846	6065602.164
	W2-14	n/a	n/a	2013552.991	6065613.269
	W2-15	n/a	n/a	2013573.164	6065610.334
	W2-16	n/a	n/a	2013566.873	6065619.001
Wharf 3	W3-01	2013018.054	6065356.263	n/a	n/a
	W3-02	2013013.005	6065375.815	2013009.215	6065394.326
	W3-03	2013035.461	6065361.051	n/a	n/a
	W3-04	2013027.416	6065379.206	2012998.019	6065389.189
	W3-05	2013052.178	6065369.322	2013045.148	6065361.041
	W3-06	2013042.909	6065386.453	2013004.648	6065365.232
	W3-07	2013043.743	6065408.346	2013022.289	6065396.305
	W3-08	2013026.451	6065397.549	2013026.738	6065372.019
	W3-09	2013011.017	6065396.338	2013098.413	6065435.410
	W3-10	2012997.361	6065413.816	n/a	n/a
	W3-11	2013018.511	6065419.679	n/a	n/a
	W3-12	2013036.848	6065430.021	n/a	n/a
	W3-13	2013029.283	6065439.909	n/a	n/a
	W3-14	2013011.492	6065445.641	n/a	n/a
	W3-15	2012994.404	6065436.938	n/a	n/a
	W3-16	2012976.344	6065432.450	n/a	n/a
	W3-17	2012956.996	6065427.587	n/a	n/a
	W3-18	2012937.234	6065420.615	n/a	n/a
	W3-19	2012938.840	6065394.341	n/a	n/a
	W3-20	2012958.083	6065400.154	n/a	n/a
	W3-21	2012977.293	6065407.239	n/a	n/a
	W3-22	2013068.122	6065457.500	n/a	n/a
	W3-23	2013078.025	6065464.731	n/a	n/a
	W3-24	2013096.939	6065467.548	n/a	n/a
	W3-25	2013111.565	6065471.969	n/a	n/a
	W3-26	2013063.473	6065439.304	n/a	n/a
	W3-27	2013082.813	6065441.005	n/a	n/a

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		Northing	Easting	Northing	Easting
Wharf 3	W3-28	2013102.745	6065448.851	n/a	n/a
	W3-29	2013122.821	6065453.051	n/a	n/a
	W3-30	2013164.684	6065466.719	n/a	n/a
	W3-31	2013161.993	6065487.139	n/a	n/a
	W3-32	2012960.954	6065341.583	n/a	n/a
	W3-33	2012975.714	6065345.512	n/a	n/a
	W3-34	2012996.892	6065350.655	n/a	n/a
	W3-35	2012952.213	6065353.751	n/a	n/a
	W3-36	2012970.268	6065361.425	n/a	n/a
	W3-37	2012991.685	6065367.676	n/a	n/a
	W3-38	2012947.580	6065374.008	2012947.459	6065385.944
	W3-39	2012965.849	6065380.288	2012976.295	6065362.393
	W3-40	2012988.300	6065389.692	2012989.152	6065376.263
	W3-41	2013080.229	6065378.049	2013096.429	6065384.607
	W3-42	2013104.207	6065385.328	n/a	n/a
	W3-43	2013079.779	6065397.439	2013089.574	6065401.017
	W3-44	2013094.655	6065402.207	2013095.773	6065400.550
	W3-45	2013113.395	6065410.630	n/a	n/a
	W3-46	2013133.130	6065416.758	n/a	n/a
	W3-47	2013067.995	6065413.718	2013080.444	6065422.317
	W3-48	2013089.859	6065423.279	2013100.61	6065414.853
	W3-49	2013110.016	6065430.600	2013110.634	6065424.320
	W3-50	2013127.947	6065434.355	2013127.51	6065437.392
	W3-51	2013172.903	6065429.373	n/a	n/a
	W3-52	2013172.840	6065445.797	-10727007.68	5832503.444
	W3-53	n/a	n/a	2013204.240	6065443.437
	W3-54	n/a	n/a	2013201.030	6065459.624
	W3-55	n/a	n/a	2012930.068	6065341.241
	W3-56	n/a	n/a	2012965.215	6065370.894
	W3-57	n/a	n/a	2012945.061	6065357.761
	W3-58	n/a	n/a	2012929.801	6065379.758
Wharf 4	W4-1	2012587.010	6065267.191	n/a	n/a
	W4-2	2012583.634	6065289.443	n/a	n/a
	W4-3	2012579.404	6065312.928	n/a	n/a
	W4-4	2012614.484	6065254.307	n/a	n/a
	W4-5	2012603.778	6065271.263	n/a	n/a
	W4-6	2012600.706	6065299.984	n/a	n/a
	W4-7	2012597.247	6065321.352	n/a	n/a
	W4-8	2012632.419	6065283.125	n/a	n/a
	W4-9	2012631.576	6065300.755	n/a	n/a
	W4-10	2012627.920	6065319.371	n/a	n/a
	W4-11	n/a	n/a	2012577.256	6065334.027
	W4-12	n/a	n/a	2012571.264	6065349.899
	W4-13	n/a	n/a	2012598.168	6065336.301
	W4-14	n/a	n/a	2012593.986	6065352.904
	W4-15	n/a	n/a	2012623.150	6065340.775

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Sims Metal Management, Redwood City, California

Area	Sample Location	Actual (June 2016)		Actual (March 2017)	
		Northing	Easting	Northing	Easting
	W4-16	n/a	n/a	2012620.327	6065358.128

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Area	Sample Location	Actual (June 2016)		Actual (March 2017)	
		Northing	Easting	Northing	Easting
Wharf 5	W5-1	2011864.430	6065253.349	n/a	n/a
	W5-2	2011851.088	6065273.548	n/a	n/a
	W5-3	2011838.088	6065292.003	n/a	n/a
	W5-4	2011900.051	6065250.285	n/a	n/a
	W5-5	2011880.743	6065280.474	n/a	n/a
	W5-6	2011875.492	6065293.475	n/a	n/a
	W5-7	2011863.260	6065312.066	n/a	n/a
	W5-8	2011906.347	6065288.402	n/a	n/a
	W5-9	2011897.339	6065310.160	n/a	n/a
	W5-10	2011888.431	6065327.859	n/a	n/a
	W5-11	n/a	n/a	2011817.153	6065320.310
	W5-12	n/a	n/a	2011807.650	6065337.206
	W5-13	n/a	n/a	2011851.807	6065331.549
	W5-14	n/a	n/a	2011843.036	6065349.130
	W5-15	n/a	n/a	2011883.113	6065342.764
	W5-16	n/a	n/a	2011872.091	6065358.699

Notes:
Coordinates are in California State Plane, Zone III, survey feet, NAD 83
NAD = North American Datum

Table 2
Sediment Sample Analytical Results - Background Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

Location		W2-01	W2-02	W2-03	W2-04	W2-05			W2-06	W2-07	W2-08
Sample Depth (ft)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	1.5-2	2.5-3	0-0.5	0-0.5	0-0.5
Sample Date		6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/13/2016	6/14/2016
Field ID		W2-1-SED-6.8-7.3	W2-2-SED-4.0-4.5	W2-3-SED-2.5-3.0	W2-4-SED-13.5-14.0	W2-5-SED-0-0.5	W2-5-SED-1.5-2.0	W2-5-SED-2.5-3.0	W2-6-SED-5.1-5.6	W2-7-SED-2.7-3.2	W2-8-SED-12.1-12.6
SDG		16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1303	16-06-1302
Inorganics											
Moisture	%	63	58	52	65	56	51	49	62	57	65
Metals											
Aluminum	mg/kg	**26000**	**29400**	**21800**	**33500**	**30100**	**32800**	**32700**	**20800**	**20800**	**25800B**
Antimony	mg/kg	<2.08	<1.87	<1.51	<2.16	<1.78	<1.6	<1.53	**4.81B**	<1.75	<2.07
Arsenic	mg/kg	**10.9**	**11.2**	**8.2**	**11.6**	**14.8**	**10.9**	**10.8**	**6.09**	**5.95**	**10.1B**
Barium	mg/kg	**67.1**	**73.8**	**65.3**	**68.1**	**77.5**	**57.6**	**54**	**52.1**	**57.4**	**54.8**
Beryllium	mg/kg	**0.628J**	**0.595J**	**0.45J**	**0.719J**	**0.667**	**0.645**	**0.652**	**0.521J**	**0.468J**	**0.594J**
Cadmium	mg/kg	<1.39	<1.25	<1.01	<1.44	<1.19	<1.07	<1.02	**0.712J**	<1.16	<1.38
Chromium (III+VI)	mg/kg	**91.9**	**157**	**111**	**103**	**101**	**93.4**	**94.3**	**84.1**	**117**	**84.6**
Cobalt	mg/kg	**13.5**	**17.5**	**14.9**	**14.9**	**15.1**	**14.1**	**14.6**	**14.2**	**15.3**	**12.8**
Copper	mg/kg	**57.4**	**55**	**45.6**	**58.1**	**77.2**	**34.6**	**35.1**	**39.8**	**57.8**	**49B**
Iron	mg/kg	**41200B**	**41200B**	**31400B**	**45600B**	**42700B**	**40700B**	**43000B**	**30600B**	**32800B**	**39900B**
Lead	mg/kg	**34**	**30.5**	**23.4**	**33.3**	**50.2**	**12.6**	**12.6**	**22.2**	**26.3**	**29.1**
Mercury	mg/kg	**1.89B**	**12.4B**	**2.81B**	**0.318B**	**1.21B**	**0.0894B,J**	**0.0781B,J**	**0.988B**	**1.59B**	**0.406B**
Molybdenum	mg/kg	**3.98**	**4.64**	**3.57**	**4.23**	**4.74**	**4.15**	**4.52**	<0.634	**3.33**	**3.55**
Nickel	mg/kg	**97.7**	**178**	**118**	**102**	**109**	**93.2**	**95.1**	**89.2**	**145**	**86.8**
Selenium	mg/kg	<2.08	<1.87	<1.51	<2.16	<1.78	<1.6	<1.53	<1.9	<1.75	<2.07
Silver	mg/kg	<0.693	<0.623	<0.504	<0.721	<0.594	<0.534	<0.51	<0.634	<0.582	<0.69
Thallium	mg/kg	<2.08	<1.87	<1.51	<2.16	<1.78	<1.6	<1.53	<1.9	<1.75	<2.07
Vanadium	mg/kg	**65.8B**	**68.8B**	**57.2B**	**79.7B**	**73.1B**	**74.7B**	**75B**	**53.4B**	**56.5B**	**63.4**
Zinc	mg/kg	**158**	**161**	**162**	**154**	**185**	**98.2**	**97.2**	**127**	**135**	**139B**
PCBs											
Aroclor 1016	µg/kg	<27	<24	<21	<28	<23	<51	<19	<26	<23	<28
Aroclor 1221	µg/kg	<27	<24	<21	<28	<23	<51	<19	<26	<23	<28
Aroclor 1232	µg/kg	<27	<24	<21	<28	<23	<51	<19	<26	<23	<28
Aroclor 1242	µg/kg	<27	<24	<21	<28	<23	<51	<19	<26	<23	<28
Aroclor 1248	µg/kg	**25J**	**34**	**28**	<28	**52**	<51	<19	**20J**	**24**	<28
Aroclor 1254	µg/kg	**58**	**68**	**48**	**22J**	**260**	<51	<19	**37**	**52**	**35**
Aroclor 1260	µg/kg	**61**	**63**	**46**	**27J**	**140**	**45J**	<19	**35**	**54**	**31**
Aroclor 1262	µg/kg	<27	<24	<21	<28	<23	<51	<19	<26	<23	<28
Total PCBs	µg/kg	**144**	**165**	**122**	**49**	**452**	**45**	<19	**92**	**130**	**66**

Notes:
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
PCB = polychlorinated biphenyls
SDG = sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for non-detects
µg/kg = micrograms per kilogram

Table 2
Sediment Sample Analytical Results - Background Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

Location		W2-09	W2-10	W4-01	W4-02	W4-03	W4-04	W4-05		
Sample Depth (ft)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	1.5-2	2.5-3
Sample Date		6/14/2016	6/14/2016	6/10/2016	6/10/2016	6/10/2016	6/9/2016	6/9/2016	6/9/2016	6/9/2016
Field ID		W2-9-SED-10.0-10.5	W2-10-SED-6.8-7.3	W4-1-SED-11.8-12.3	W4-2-SED-8.5-9.0	W4-3-SED-4.0-4.5	W4-4-SED-12.8-13.3	W4-5-SED-0-0.5	W4-5-SED-1.5-2.0	W4-5-SED-2.5-3.0
SDG		16-06-1302	16-06-1302	16-06-0862	16-06-0862	16-06-0862	16-06-0863	16-06-0863	16-06-0863	16-06-0863
Inorganics										
Moisture	%	63	59	65	64	64	64	60	60	59
Metals										
Aluminum	mg/kg	**27300B**	**25700B**	**28300B**	**26000B**	**24700B**	**27100B**	**26600B**	**24600B**	**27200B**
Antimony	mg/kg	<2.03	<1.91	<2.15	<2.09	<2.04	<2.18	<1.88	<1.97	<1.87
Arsenic	mg/kg	**8.16B**	**6.65B**	**9.91**	**9.47**	**7.21**	**8.65**	**8.37**	**10.1**	**11.2**
Barium	mg/kg	**61.4**	**61.5**	**64.4**	**59.6**	**75.8**	**60.4**	**61**	**59.5**	**57**
Beryllium	mg/kg	**0.61J**	**0.503J**	**0.777**	**0.703**	**0.659J**	**0.722J**	**0.715**	**0.677**	**0.721**
Cadmium	mg/kg	<1.35	<1.27	**0.71J**	**0.74J**	**0.784J**	**0.618J**	**0.857J**	**1.24J**	**1.18J**
Chromium (III+VI)	mg/kg	**96.4**	**116**	**106**	**97.5**	**94.6**	**97.7**	**103**	**97.1**	**103**
Cobalt	mg/kg	**13.6**	**14.5**	**18.6**	**17.6**	**17.5**	**17.9**	**18.4**	**17.9**	**18.6**
Copper	mg/kg	**52.1B**	**46.1B**	**60.7**	**56.1**	**61.4**	**57.4**	**66.6**	**66.5**	**64**
Iron	mg/kg	**41800B**	**34400B**	**44000B**	**41000B**	**38600B**	**41100B**	**41400B**	**39600B**	**41200B**
Lead	mg/kg	**31.1**	**24**	**33.3**	**30.1**	**38.8**	**37.9**	**40.1**	**53.4**	**48.4**
Mercury	mg/kg	**0.699B**	**3.04B**	**0.223J**	**0.239**	**0.438**	<0.234	**0.384**	**0.519**	**0.46**
Molybdenum	mg/kg	**4.04**	**3.58**	<0.715	<0.698	<0.679	<0.728	<0.628	<0.658	<0.624
Nickel	mg/kg	**105**	**139**	**107**	**98.8**	**96.3**	**98**	**106**	**98.8**	**110**
Selenium	mg/kg	<2.03	<1.91	<2.15	<2.09	<2.04	<2.18	<1.88	<1.97	<1.87
Silver	mg/kg	<0.676	<0.635	**0.384J**	**0.437J**	<0.679	<0.728	**0.622J**	**1.21**	**0.816**
Thallium	mg/kg	<2.03	<1.91	<2.15	<2.09	<2.04	<2.18	<1.88	<1.97	**0.386J**
Vanadium	mg/kg	**65.8**	**61.8**	**80.3**	**73.4**	**69.3**	**75.7**	**75.7**	**75.8**	**79.6**
Zinc	mg/kg	**147B**	**134B**	**158B**	**148B**	**163B**	**142B**	**166B**	**169B**	**168B**
PCBs										
Aroclor 1016	µg/kg	<27	<24	<29	<27	<28	<28	<25	<25	<24
Aroclor 1221	µg/kg	<27	<24	<29	<27	<28	<28	<25	<25	<24
Aroclor 1232	µg/kg	<27	<24	<29	<27	<28	<28	<25	<25	<24
Aroclor 1242	µg/kg	<27	<24	<29	<27	<28	<28	<25	<25	<24
Aroclor 1248	µg/kg	**20J**	**30**	<29	<27	**33**	<28	**86**	**17J**	<24
Aroclor 1254	µg/kg	**84**	**84**	<29	**19J**	**36**	<28	**90**	**22J**	<24
Aroclor 1260	µg/kg	**76**	**86**	**35**	**27J**	**41**	**52**	**43**	**33**	**23J**
Aroclor 1262	µg/kg	<27	<24	<29	<27	<28	<28	<25	<25	<24
Total PCBs	µg/kg	**180**	**200**	**35**	**46**	**110**	**52**	**219**	**72**	**23**

Notes:
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
PCB = Polychlorinated biphenyls
SDG = Sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for Non-Detects
µg/kg = micrograms per kilogram

Table 2
Sediment Sample Analytical Results - Background Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

Location		W4-06	W4-07	W4-08	W4-09	W4-10	W5-01	W5-02	W5-03	W5-04
Sample Depth (ft)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Sample Date		6/9/2016	6/9/2016	6/10/2016	6/10/2016	6/10/2016	6/14/2016	6/14/2016	6/14/2016	6/15/2016
Field ID		W4-6-SED-7.5-8.0	W4-7-SED-4.4-4.9	W4-8-SED-9.6-10.1	W4-9-SED-6.7-7.2	W4-10-SED-2.4-2.9	W5-1-SED-21.4-21.9	W5-2-SED-14.5-15.(	W5-3-SED-9.6-10.1	W5-4-SED-25.8-26.3
SDG		16-06-0863	16-06-0863	16-06-0862	16-06-0862	16-06-0862	16-06-1302	16-06-1302	16-06-1302	16-06-1304
Inorganics										
Moisture	%	65	61	66	64	61	65	65	68	66
Metals										
Aluminum	mg/kg	**27100B**	**22400B**	**25200B**	**26500B**	**23700B**	**32900B**	**32400B**	**38200B**	**27100**
Antimony	mg/kg	<2.19	<1.88	<2.11	<2.20	<1.95	<2.16	<2.14	<2.35	<2.29
Arsenic	mg/kg	**8.32**	**7.3**	**8.51**	**7.31**	**7.63**	**9.88B**	**10.3B**	**10.8B**	**9.07**
Barium	mg/kg	**60.8**	**80**	**56.8**	**58.4**	**95.3**	**68.4**	**66**	**76.1**	**60.5**
Beryllium	mg/kg	**0.742**	**0.622J**	**0.704J**	**0.706J**	**0.635J**	**0.739**	**0.731**	**0.79**	**0.716J**
Cadmium	mg/kg	**0.709J**	**2.79**	**0.592J**	**0.588J**	**0.918J**	<1.44	<1.43	<1.56	**0.538J**
Chromium (III+VI)	mg/kg	**99.9**	**93.2**	**94.7**	**97.9**	**103**	**103**	**102**	**114**	**99.3**
Cobalt	mg/kg	**17.8**	**17.2**	**17.3**	**17.8**	**18.6**	**14.1**	**13.5**	**15.6**	**18.3**
Copper	mg/kg	**57.5**	**99.6**	**56.7**	**56.7**	**94.9**	**60.8B**	**57.6B**	**62.1B**	**57.6**
Iron	mg/kg	**42500B**	**35900B**	**40300B**	**41000B**	**38000B**	**45000B**	**44800B**	**48900B**	**43000B**
Lead	mg/kg	**31.3**	**40.3**	**30.2**	**31.6**	**80.3**	**33.7**	**31**	**32.5**	**31.6**
Mercury	mg/kg	<0.252	**0.537**	**0.245**	**0.244**	**0.607**	**0.336B**	**0.31B**	**0.305B**	**0.225J**
Molybdenum	mg/kg	<0.729	<0.627	<0.705	<0.733	**0.642J**	**4.24**	**4.32**	**5.01**	<0.764
Nickel	mg/kg	**100**	**95.6**	**96.2**	**98.5**	**98.6**	**101**	**102**	**111**	**99.2**
Selenium	mg/kg	<2.19	<1.88	<2.11	<2.20	<1.95	<2.16	<2.14	<2.35	<2.29
Silver	mg/kg	<0.729	**0.388J**	<0.705	<0.733	<0.649	<0.718	<0.714	<0.782	<0.764
Thallium	mg/kg	<2.19	<1.88	<2.11	<2.20	<1.95	<2.16	<2.14	<2.35	**0.547J**
Vanadium	mg/kg	**75.6**	**65.3**	**71.7**	**73.8**	**69**	**77.9**	**75.6**	**88**	**74.6**
Zinc	mg/kg	**146B**	**169B**	**140B**	**143B**	**200B**	**159B**	**150B**	**161B**	**154B**
PCBs										
Aroclor 1016	µg/kg	<29	<26	<29	<28	<26	<28	<29	<31	<29
Aroclor 1221	µg/kg	<29	<26	<29	<28	<26	<28	<29	<31	<29
Aroclor 1232	µg/kg	<29	<26	<29	<28	<26	<28	<29	<31	<29
Aroclor 1242	µg/kg	<29	<26	<29	<28	<26	<28	<29	<31	<29
Aroclor 1248	µg/kg	**18J**	**29**	<29	<28	**52**	<28	<29	<31	<29
Aroclor 1254	µg/kg	**20J**	**41**	<29	**19J**	**110**	**23J**	**20J**	<31	**21J**
Aroclor 1260	µg/kg	**32**	**60**	**34**	**32**	**97**	**46**	**35**	**30J**	**36**
Aroclor 1262	µg/kg	<29	<26	<29	<28	<26	<28	<29	<31	<29
Total PCBs	µg/kg	**70**	**130**	**34**	**51**	**259**	**69**	**55**	**30**	**57**

Notes:
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
PCB = Polychlorinated biphenyls
SDG = Sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for Non-Detects
µg/kg = micrograms per kilogram

Table 2
Sediment Sample Analytical Results - Background Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

Location		W5-05			W5-06	W5-07	W5-08	W5-09	W5-10
Sample Depth (ft)		0-0.5	1.5-2	2-2.25	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Sample Date		6/15/2016	6/15/2016	6/15/2016	6/14/2016	6/14/2016	6/15/2016	6/15/2016	6/15/2016
Field ID		W5-5-SED-0-0.5	W5-5-SED-1.5-2.0	W5-5-SED-2.0-2.25	W5-6-SED-12.1-12.6	W5-7-SED-9.4-9.9	W5-8-SED-18.3-18.8	W5-9-SED-10.4-10.9	W5-10-SED-6.7-7.2
SDG		16-06-1304	16-06-1304	16-06-1304	16-06-1302	16-06-1302	16-06-1304	16-06-1304	16-06-1304
Inorganics									
Moisture	%	60	45	46	65	65	65	62	69
Metals									
Aluminum	mg/kg	**28800**	**26100**	**27600**	**31600B**	**35600B**	**28000**	**29700**	**33000**
Antimony	mg/kg	<1.95	<1.42	<1.39	<2.17	<2.16	<2.27	<2.07	<2.36
Arsenic	mg/kg	**8.11**	**4.76**	**6.98**	**12B**	**9.88B**	**8.76**	**8.54**	**8.02**
Barium	mg/kg	**60.1**	**44.5**	**47.1**	**62.6**	**75.2**	**60.8**	**53.2**	**68.5**
Beryllium	mg/kg	**0.699**	**0.634**	**0.648**	**0.686J**	**0.724**	**0.721J**	**0.735**	**0.83**
Cadmium	mg/kg	**0.794J**	**0.607J**	**0.625J**	<1.45	<1.44	**0.678J**	**0.718J**	**0.912J**
Chromium (III+VI)	mg/kg	**102**	**92.7**	**94.2**	**102**	**106**	**101**	**105**	**116**
Cobalt	mg/kg	**19.4**	**18.7**	**18.8**	**14**	**15**	**18.9**	**19.9**	**21.3**
Copper	mg/kg	**56.3**	**41**	**40.6**	**49.4B**	**55.8B**	**59.8**	**49.6**	**70.5**
Iron	mg/kg	**43600B**	**40500B**	**42200B**	**44500B**	**46900B**	**44200B**	**45800B**	**48000B**
Lead	mg/kg	**23.5**	**11.4**	**11.2**	**25.1**	**29.9**	**30.7**	**20.7**	**34.6**
Mercury	mg/kg	**0.103J**	**0.0295J**	**0.032J**	**0.217B,J**	**0.228B,J**	**0.207J**	**0.115J**	**0.303**
Molybdenum	mg/kg	**0.767**	<0.473	<0.463	**4.46**	**4.89**	<0.756	<0.689	<0.786
Nickel	mg/kg	**103**	**98.4**	**98.4**	**101**	**106**	**103**	**108**	**115**
Selenium	mg/kg	<1.95	-	**2.64**	<2.17	<2.16	<2.27	<2.07	<2.36
Silver	mg/kg	<0.65	<0.473	<0.463	<0.723	<0.722	<0.756	**0.24J**	<0.786
Thallium	mg/kg	<1.95	<1.42	<1.39	<2.17	<2.16	<2.27	<2.07	<2.36
Vanadium	mg/kg	**80**	**73.7**	**76.1**	**76.5**	**82**	**75.9**	**80.5**	**87.9**
Zinc	mg/kg	**141B**	**106B**	**104B**	**162B**	**157B**	**167B**	**135B**	**190B**
PCBs									
Aroclor 1016	µg/kg	<25	<18	<19	<28	<29	<28	<27	<32
Aroclor 1221	µg/kg	<25	<18	<19	<28	<29	<28	<27	<32
Aroclor 1232	µg/kg	<25	<18	<19	<28	<29	<28	<27	<32
Aroclor 1242	µg/kg	<25	<18	<19	<28	<29	<28	<27	<32
Aroclor 1248	µg/kg	**23J**	<18	<19	<28	<29	**19J**	<27	<32
Aroclor 1254	µg/kg	**16J**	<18	<19	**48**	**19J**	**23J**	<27	**27J**
Aroclor 1260	µg/kg	**33**	<18	<19	**44**	**29**	**44**	**26J**	**47**
Aroclor 1262	µg/kg	<25	<18	<19	<28	<29	<28	<27	<32
Total PCBs	µg/kg	**72**	<18	<19	**92**	**48**	**86**	**26**	**74**

Notes:
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
PCB = Polychlorinated biphenyls
SDG = Sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for Non-Detects
µg/kg = micrograms per kilogram

Table 3
Statistical Evaluation - Background Subtidal Sediment Data
Sediment Investigation Report
Sims Metal Management, Redwood City, California

			Number Samples	Number Detects	Min	Max	Mean	St Dev	95% UCL Concentration Background	95% UTL Concentration Background
Metals	Aluminum	mg/kg	36	36	20800	38200	27975	4072	29122	37789
	Antimony	mg/kg	36	1	<1.39	4.81	0.13	0.8	NC	NC
	Arsenic	mg/kg	36	36	4.76	14.8	9.1	2	9.63	13.37
	Barium	mg/kg	36	36	44.5	95.3	63	9.9	66.19	84.69
	Beryllium	mg/kg	36	36	0.45	0.83	0.67	0.085	0.693	0.852
	Cadmium	mg/kg	36	20	0.538	2.79	0.48	0.57	0.926	2.79
	Chromium	mg/kg	36	36	84.1	157	102	12	105.7	157
	Cobalt	mg/kg	36	36	12.8	21.3	17	2.2	17.23	21.3
	Copper	mg/kg	36	36	34.6	99.6	57	14	61.3	90.98
	Iron	mg/kg	36	36	30600	48900	41314	4232	42506	48900
	Lead	mg/kg	36	36	11.2	80.3	32	13	35.39	51.68
	Mercury	mg/kg	36	34	0.0295	12.4	0.88	2.1	3.077	4.958
	Molybdenum	mg/kg	36	18	<0.463	5.01	1.9	2.1	2.689	5.01
	Nickel	mg/kg	36	36	86.8	178	106	17	110.7	178
	Selenium	mg/kg	35	1	<1.51	2.64	0.075	0.45	NC	NC
	Silver	mg/kg	36	7	0.24	1.21	0.11	0.27	0.501	0.806
	Thallium	mg/kg	36	2	0.386	0.547	0.026	0.11	NC	NC
	Vanadium	mg/kg	36	36	53.4	88	73	7.9	75.27	90.11
	Zinc	mg/kg	36	36	97.2	200	150	23	156.5	200.1
PCBs	Total PCBs	µg/kg	36	33	<18	452	93	87	157.1	395

Notes:
mg/kg = miligrams per kilogram
µg/kg = micrograms per kilogram
Metals = Title 22 Metals, aluminum, iron
NC = not calculated
PCB = polychlorinated biphenyls
St Dev = standard deviation
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 4
Sediment Sample Analytical Results - Background Riprap Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

Location		W2-11	W2-12	W2-13	W2-14	W2-15	W2-16	W4-11	W4-12	W4-13	W4-14	W4-15	W4-16	W5-11	W5-12	W5-13	W5-14	W5-15	W5-16
Sample Depth (ft)		0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5	0-0.5
Sample Date		3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/9/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017	3/14/2017
Field ID		W2-11-SED-0-0.5	W2-12-SED-0-0.5	W2-13-SED-0-0.5	W2-14-SED-0-0.5	W2-15-SED-0-0.5	W2-16-SED-0-0.5	W4-11-SED-0-0.5	W4-12-SED-0-0.5	W4-13-SED-0-0.5	W4-14-SED-0-0.5	W4-15-SED-0-0.5	W4-16-SED-0-0.5	W5-11-SED-0-0.5	W5-12-SED-0-0.5	W5-13-SED-0-0.5	W5-14-SED-0-0.5	W5-15-SED-0-0.5	W5-16-SED-0-0.5
SDG		17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-0879	17-03-1186	17-03-1186	17-03-1186	17-03-1186	17-03-1186	17-03-1186
Inorganics																			
Moisture	%	53	34	46	38	50	44	61	64	63	60	65	60	64	58	64	63	69	61
Metals																			
Aluminum	mg/kg	**16700**	**11100**	**16500**	**16900**	**16500**	**17300**	**24600**	**20200**	**21300**	**22800**	**24000**	**22300**	**28400**	**20600**	**25300**	**27300**	**35500**	**29000**
Antimony	mg/kg	<1.63	<1.13	<1.45	<1.21	<1.53	<1.31	<1.9	<2.04	<2.02	<1.83	<2.04	<1.94	<2.06	<1.81	<2.07	<1.94	<2.37	<1.86
Arsenic	mg/kg	**10.4**	**5.78**	**9.92**	**8.84**	**8.73**	**7.14**	**13.2**	**16.2**	**13.1**	**13.6**	**12.4**	**14.6**	**16.2**	**21.3**	**16.2**	**17.2**	**18.2**	**13.2**
Barium	mg/kg	**59**	**64**	**82.7**	**93.1**	**43.2**	**76.8**	**83.2**	**242**	**106**	**137**	**81.5**	**110**	**138**	**155**	**145**	**114**	**123**	**101**
Beryllium	mg/kg	**0.384J**	**0.206J**	**0.329J**	**0.272J**	**0.346J**	**0.335J**	**0.645**	**0.496J**	**0.573J**	**0.594J**	**0.635J**	**0.57J**	**0.576J**	**0.419J**	**0.524J**	**0.558J**	**0.725J**	**0.62**
Cadmium	mg/kg	**1.15**	**0.771**	**1.22**	**0.931**	**1.05**	**0.891**	**1.74**	**2.14**	**2.03**	**1.65**	**1.66**	**1.92**	**1.94**	**2.1**	**1.67**	**1.49**	**1.91**	**1.17J**
Chromium (III+VI)	mg/kg	**119**	**60.6**	**114**	**69.8**	**111**	**79.1**	**99.1**	**93**	**90.4**	**96.5**	**97.9**	**93.2**	**94.2**	**79**	**86.4**	**95.8**	**114**	**95.2**
Cobalt	mg/kg	**20**	**13.4**	**21.1**	**17.9**	**18.7**	**17.7**	**21.9**	**21.1**	**19.3**	**23.9**	**21**	**22.5**	**19.9**	**18**	**19.3**	**22.1**	**25.7**	**21.6**
Copper	mg/kg	**75.1**	**48.9**	**48.4**	**67.9**	**63.8**	**56.5**	**86.4**	**105**	**77.7**	**146**	**88.4**	**107**	**75.7**	**165**	**135**	**83.7**	**124**	**71**
Iron	mg/kg	**30400B**	**21900B**	**31200B**	**26100B**	**34700B**	**28300B**	**41500B**	**39500B**	**38000B**	**39900B**	**40600B**	**39200B**	**38100B**	**30200B**	**33300B**	**38700B**	**44900B**	**37000B**
Lead	mg/kg	**22.2**	**17.5**	**27.1**	**23.7**	**19.4**	**23**	**48.5**	**86.1**	**70.7**	**77.3**	**57**	**106**	**59.5**	**174**	**55.3**	**79.9**	**53.2**	**46.2**
Mercury	mg/kg	**23.8**	**1.9**	**4.84**	**5.78**	**0.397**	**13.8**	**0.319**	**0.294**	**0.314**	**0.512**	**0.298**	**0.349**	**0.357**	**0.279**	**0.26**	**0.229**	**0.279**	**0.321**
Molybdenum	mg/kg	**0.68**	**0.295J**	**0.606**	**1.61**	**2.52**	**0.623**	**1.79**	**2.11**	**2.71**	**1.34**	**2.04**	**1.27**	**2.31**	**3.86**	**2.08**	**1.85**	**1.77**	**0.801**
Nickel	mg/kg	**140**	**86.2**	**129**	**96.6**	**132**	**109**	**106**	**99.4**	**96.2**	**120**	**106**	**107**	**95.8**	**75.5**	**89.1**	**100**	**117**	**101**
Selenium	mg/kg	<1.63	<1.13	<1.45	<1.21	<1.53	<1.31	<1.9	<2.04	<2.02	**1.09J**	<2.04	<1.94	<2.06	**1.19J**	**1.2J**	**1.79J**	<2.37	<1.86
Silver	mg/kg	<0.542	**0.312J**	<0.483	<0.404	<0.51	**0.306J**	**0.759**	**0.721**	**0.353J**	**0.771**	**0.496J**	**0.375J**	**0.892**	**1.46**	**0.708**	**0.955**	**0.872**	**0.699**
Thallium	mg/kg	<1.63	<1.13	<1.45	<1.21	<1.53	<1.31	<1.9	<2.04	<2.02	<1.83	<2.04	<1.94	<2.06	**0.477J**	<2.07	<1.94	<2.37	<1.86
Vanadium	mg/kg	**58.3**	**42.6**	**59.3**	**50**	**51.1**	**55.4**	**76.9**	**66.5**	**69**	**72.5**	**74.3**	**70.7**	**80**	**62.1**	**73.2**	**77.5**	**94.9**	**77.5**
Zinc	mg/kg	**154B**	**143B**	**177B**	**143B**	**159B**	**145B**	**290B**	**559B**	**331B**	**517B**	**296B**	**602B**	**303**	**480**	**268**	**370**	**289**	**240**
PCBs																			
Aroclor 1016	µg/kg	<21	<15	<37	<16	<20	<18	<25	<28	<27	<25	<28	<25	<28	<24	<28	<27	<65	<26
Aroclor 1221	µg/kg	<21	<15	<37	<16	<20	<18	<25	<28	<27	<25	<28	<25	<28	<24	<28	<27	<65	<26
Aroclor 1232	µg/kg	<21	<15	<37	<16	<20	<18	<25	<28	<27	<25	<28	<25	<28	<24	<28	<27	<65	<26
Aroclor 1242	µg/kg	<21	<15	<37	<16	<20	<18	<25	<28	<27	<25	<28	<25	<28	<24	<28	<27	<65	<26
Aroclor 1248	µg/kg	**70**	**34**	**140**	**34**	**110**	**31**	**88**	**330**	**200**	**210**	**130**	**370**	**120**	**290**	**120**	**100**	**140**	**72**
Aroclor 1254	µg/kg	**270**	**51**	**470**	**48**	**220**	**37**	**72**	**280**	**180**	**140**	**140**	**260**	**220**	**310**	**290**	**240**	**810**	**85**
Aroclor 1260	µg/kg	**200**	**37**	**220**	**42**	**190**	**88**	**66**	**200**	**130**	**110**	**110**	**190**	**88**	**110**	**130**	**94**	**240**	**58**
Aroclor 1262	µg/kg	<21	<15	<37	<16	<20	<18	<25	<28	<27	<25	<28	<25	<28	<24	<28	<27	<65	<26
Total PCBs	µg/kg	**540**	**120**	**820**	**120**	**520**	**160**	**230**	**820**	**510**	**460**	**380**	**810**	**430**	**710**	**540**	**430**	**1200**	**210**

Notes:
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
PCB = polychlorinated biphenyls
SDG = sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for non-detects
µg/kg = micrograms per kilogram

Table 5
Statistical Evaluation - Background Subtidal Sediment Data
Sediment Investigation Report
Sims Metal Management, Redwood City, California

			Number Samples	Number Detects	Min	Max	Mean	Median	St Dev	95% UCL Concentration Background	95% UTL Concentration Background
Metals	Aluminum	mg/kg	18	18	11100	35500	22017	21800	5860	24,420	36,392
	Antimony	mg/kg	18	0	<1.13	<2.37	0.9	0.9	0.2	NC	NC
	Arsenic	mg/kg	18	18	5.78	21.3	13	13.2	4.1	14.8	23.18
	Barium	mg/kg	18	18	43.2	242	109	103.5	46	127.3	220.3
	Beryllium	mg/kg	18	18	0.206	0.725	0.49	0.541	0.15	0.55	0.851
	Cadmium	mg/kg	18	18	0.771	2.14	1.5	1.655	0.45	1.709	2.629
	Chromium	mg/kg	18	18	60.6	119	94	94.7	15	100.1	131.4
	Cobalt	mg/kg	18	18	13.4	25.7	20	20.5	2.7	21.4	26.97
	Copper	mg/kg	18	18	48.4	165	90	80.7	34	104.1	172.7
	Iron	mg/kg	18	18	21900	44900	35194	37500	6071	37,684	50,085
	Lead	mg/kg	18	18	17.5	174	58	54.25	39	74.05	153.3
	Mercury	mg/kg	18	18	0.229	23.8	3	0.335	6.2	17.57	23.8
	Molybdenum	mg/kg	18	18	0.295	3.86	1.7	1.78	0.9	2.049	3.883
	Nickel	mg/kg	18	18	75.5	140	106	103.5	17	112.7	146.6
	Selenium	mg/kg	18	4	1.09	1.79	0.97	0.99	0.28	1.339	1.699
	Silver	mg/kg	18	14	0.306	1.46	0.59	0.5975	0.34	0.745	1.362
	Thallium	mg/kg	18	1	0.477	0.477	0.87	0.94	0.2	NC	NC
	Vanadium	mg/kg	18	18	42.6	94.9	67	69.85	13	72.62	99
	Zinc	mg/kg	18	18	143	602	304	289.5	149	364.8	669.4
PCBs	Total PCBs	µg/kg	18	18	120	1200	501	485	290	619.3	1211

Notes:
mg/kg = miligrams per kilogram
µg/kg = micrograms per kilogram
Metals = Title 22 Metals, aluminum, iron
NC = not calculated
PCB = polychlorinated biphenyls
St Dev = standard deviation
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 6a
Sediment Sample Analytical Results - Project Area, Riprap Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

terraphase engineering

							Metals																		PCBs								
							Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Total PCBs
					Screening Levels		%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
					95% UCL Riprap Background		n/a	24420	--	14.8	127.3	0.55	1.709	100.1	21.4	104.1	37684	74.05	17.57	2.049	112.7	1.339	0.745	--	72.62	364.8	--	--	--	--	--	--	--	--	619.3
					95% UTL Riprap Background		n/a	36392	--	23.18	220.3	0.851	2.629	131.4	26.97	172.7	59035	153.3	23.8	3.883	146.6	1.699	1.362	--	99	669.4	--	--	--	--	--	--	--	--	1211
Sample Type	Location	Sample Depth	Sample Date	Field ID	SDG																													
Riprap	W3-10	0-0.5	6/8/2016	W3-10-SED-0-0.5	16-06-0657	67	**24600B**	**4.21B**	32	**151**	**0.676J**	4.02	**120**	34.6	365	69200	171	**1.7**	**2.54**	705	<2.31	1.38	<2.31	**83.3**	1770	<31	<31	<31	<31	**100**	**64**	**140**	<31	**304**
	W3-11	0-0.5	6/8/2016	W3-11-SED-0-0.5	16-06-0657	54	**13800B**	**11.6B**	79.5	**182**	**0.357J**	5.94	461	31.8	2320	164000	379	**1.27**	20.2	222	<1.71	6	<1.71	**82.3**	4740	<110	<110	<110	<110	**540**	**800**	**330**	<110	3670
	W3-12	0-0.5	6/8/2016	W3-12-SED-0-0.5	16-06-0657	58	**15400B**	**0.507B,J**	56.2	**141**	**0.45J**	**2.52**	261	38.5	2230	141000	1120	**0.448**	25	218	<1.73	3.84	<1.73	**80.9**	3120	<120	<120	<120	<120	**710**	**490**	**470**	<120	1670
	W3-13	0-0.5	6/8/2016	W3-13-SED-0-0.5	16-06-0657	65	**12100B**	<2.12	**19.1**	**204**	<0.706	7.49	228	36.3	1640	193000	469	**0.641**	30.8	688	**1.41J**	**1.28**	<2.12	**60.4**	4910	<140	<140	<140	<140	**990**	**600**	**350**	<140	1940
	W3-14	0-0.5	6/8/2016	W3-14-SED-0-0.5	16-06-0657	56	**14300B**	**10.9B**	103	491	<0.588	13.9	261	64.4	1950	181000	1570	**1.51**	37.2	459	2.23	5.45	<1.76	**64.9**	11200	<230	<230	<230	<230	**1100**	**1800**	**650**	<230	3550
	W3-15	0-0.5	6/8/2016	W3-15-SED-0-0.5	16-06-0657	54	**14600B**	**10.2B**	73.1	591	**0.468J**	10.6	184	46.2	2790	104000	1110	**2.7**	12.5	348	<1.59	3.54	<1.59	**61.7**	7800	<220	<220	<220	<220	**1400**	**1900**	**880**	<220	4180
	W3-16	0-0.5	6/8/2016	W3-16-SED-0-0.5	16-06-0657	54	**20300**	<1.57	**15.9**	346	**0.554**	5.43	155	34.9	981	74800	507	**1.28**	6.34	241	**1.17J**	1.75	<1.57	**69.3**	4250	<220	<220	<220	<220	**2200**	**1600**	**540**	<220	4340
	W3-17	0-0.5	6/8/2016	W3-17-SED-0-0.5	16-06-0657	53	**18000**	<1.61	**19.7**	421	**0.447J**	4.46	137	31	1070	74100	568	**1.68**	6.88	180	<1.61	**1.24**	<1.61	**60.6**	4310	<210	<210	<210	<210	**4200**	**2500**	**820**	<210	7520
	W3-18	0-0.5	6/8/2016	W3-18-SED-0-0.5	16-06-0657	53	**21800**	<1.62	37.5	321	**0.736**	**2.3**	169	30.2	379	50600	311	**0.761**	12.9	166	2.2	**0.907**	**1.13J**	**68.4**	2340	<210	<210	<210	<210	**1100**	**790**	**470**	<210	2360
	W3-19	0-0.5	6/8/2016	W3-19-SED-0-0.5	16-06-0657	63	**25400**	<2.04	**12.8**	**148**	**0.677J**	**1.56**	**101**	**21.6**	238	**41500**	**106**	**0.526**	**3.13**	**108**	<2.04	**0.403J**	<2.04	**74.2**	**541**	<130	<130	<130	<130	**430**	**590**	**270**	<130	1290
	W3-20	0-0.5	6/8/2016	W3-20-SED-0-0.5	16-06-0657	63	**27700**	<1.96	**20.5**	**120**	**0.709**	3.51	**122**	**25**	185	54300	**152**	**0.798**	4.43	**130**	<1.96	**0.402J**	<1.96	**80.1**	955	<54	<54	<54	<54	**580**	**370**	**100**	<54	**1050**
	W3-21	0-0.5	6/8/2016	W3-21-SED-0-0.5	16-06-0657	64	**28600**	<2.17	**11.7**	**99.7**	**0.742**	**1.55**	**107**	**22.7**	**132**	**46300**	**76.9**	**1.45**	**2.43**	**124**	<2.17	**0.522J**	<2.17	**81.4**	**572**	<28	<28	<28	<28	**240**	**180**	**120**	<28	**540**
	W3-22	0-0.5	6/8/2016	W3-22-SED-0-0.5	16-06-0657	45	**7320B**	**16.9B**	158	594	<0.477	17.4	163	49.1	1310	169000	1450	**3.92**	26.2	609	<1.43	4.52	<1.43	**44.2**	28500	<360	<360	<360	<360	**3400**	**2100**	**1300**	<360	6800
	W3-23	0-0.5	6/8/2016	W3-23-SED-0-0.5	16-06-0657	40	**8440B**	**22.3B**	118	778	<0.417	11.4	249	64.3	3330	195000	1820	**4.19**	35	658	2.8	4.19	<1.25	**54.4**	22800	<330	<330	<330	<330	**300J**	**2200**	**1100**	<330	3600
	W3-24	0-0.5	6/8/2016	W3-24-SED-0-0.5	16-06-0657	46	**10100B**	**16.7B**	82.9	769	**0.352J**	10.9	280	53.3	3110	146000	1620	**3.44**	21.2	591	<1.45	3.06	<1.45	**56.7**	9390	<370	<370	<370	<370	**2100**	**1700**	**1000**	<370	4800
	W3-25	0-0.5	6/8/2016	W3-25-SED-0-0.5	16-06-0657	45	**13700**	<1.39	**12**	442	**0.317J**	3.1	**113**	30	1270	71000	712	**1.78**	18.8	189	<1.39	**1.13**	<1.39	**50.6**	5440	<360	<360	<360	<360	**4300**	**2700**	**760**	<360	7760
	W3-26	0-0.5	6/8/2016	W3-26-SED-0-0.5	16-06-0657	62	**20700B**	**5.71B**	23.4	**80.1**	**0.618J**	**0.555J**	**104**	**21.1**	212	75300	**77.2**	**0.323**	**2.42**	**122**	<2.02	**1.24**	<2.02	**72.5**	913	<26	<26	<26	<26	**60**	**52**	**41**	<26	**153**
	W3-27	0-0.5	6/8/2016	W3-27-SED-0-0.5	16-06-0657	59	**13100B**	**6.13B**	68.7	**219**	<0.647	3.33	488	73.8	3970	128000	614	**0.562**	42.7	371	<1.94	2.54	<1.94	**97.8**	3610	<120	<120	<120	<120	**1100**	**620**	**290**	<120	2010
	W3-28	0-0.5	6/8/2016	W3-28-SED-0-0.5	16-06-0657	55	**18000B**	**6.75B**	46.7	243	**0.553**	5.38	161	**26.7**	623	81700	447	**0.672**	7.55	180	4.3	1.5	<1.62	**79.8**	2670	<110	<110	<110	<110	**540**	**340**	**190**	<110	**1070**
	W3-29	0-0.5	6/8/2016	W3-29-SED-0-0.5	16-06-0657	52	**16900**	<1.48	**16.8**	**158**	**0.448J**	**1.33**	**114**	**18.3**	579	**46200**	**147**	**0.507**	3.95	**98.7**	**1.5**	**0.729**	<1.48	**54.5**	919	<100	<100	<100	<100	**740**	**560**	**200**	<100	1500
	W3-30	0-0.5	6/8/2016	W3-30-SED-0-0.5	16-06-0657	61	**26800**	<1.88	**12.8**	**92.3**	**0.706**	**0.644J**	**95.7**	**20.8**	**77.7**	**45100**	**51.1**	**0.338**	<0.628	**101**	**1.12J**	**0.431J**	**0.922J**	**74.3**	**342**	<25	<25	<25	<25	**93**	**85**	**64**	<25	**242**
	W3-31	0-0.5	6/8/2016	W3-31-SED-0-0.5	16-06-0657	29	**13000**	<1.09	**14.6**	296	**0.319J**	**1.96**	141	**18.8**	358	**48600**	569	**0.434**	5.04	386	<1.09	**0.345J**	<1.09	**54**	1470	<140	<140	<140	<140	**520**	**530**	**340**	<140	1390
	W3-58	0-0.5	3/8/2017	W3-58-SED-0-0.5	17-03-0770	67	**20800**	<2.23	**9.23**	**80.4**	**0.573J**	**1.65**	**92.1**	**19.1**	**68.2**	**37500B**	**46.2**	**0.486**	**0.764**	**102**	**2.35**	**0.593J**	<2.23	**64.4**	**232**	<30	<30	<30	<30	**100**	**89**	**50**	<30	**240**

Notes:

Sample depths are shown in feet below sediment suface
-- = insufficient data points for statistical calculations
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
Bold colored concentrations are in exceedance of their corresponding screening level (shown at top)
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
n/a = not applicable
PCB = polychlorinated biphenyls
SDG = sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for non-detects
µg/kg = micrograms per kilogram
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 6b
Sediment Sample Analytical Results - Project Area, Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

terraphase engineering

							Metals																				PCBs								
						Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Total PCBs
					Screening Levels	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
					95% UCL Subtidal Background	n/a	29122	--	9.63	66.19	0.693	0.926	105.7	17.23	61.3	42506	35.39	3.077	2.689	110.7	--	0.501	--	75.27	156.5	--	--	--	--	--	--	--	--	157.1
					95% UTL Subtidal Background	n/a	37789	--	13.37	84.69	0.852	2.79	157	21.3	90.98	48900	51.68	4.958	5.01	178	--	0.905	--	90.11	230.1	--	--	--	--	--	--	--	--	395
Sample Type	Location	Sample Depth (ft)	Sample Date	Field ID	SDG																													
Subtidal	W3-01	0-0.5	6/6/2016	W3-1-SED-23.2-23.8	16-06-0655	66	**23000B**	**0.705B,J**	**12.1**	92.4	**0.697J**	<1.45	**89.7**	**19.1**	**66.6**	**42800**	**41.7**	**0.34**	<0.727	**103**	<2.18	**0.796**	<2.18	**72.3**	208	<29	<29	<29	<29	**44**	**34**	**45**	<29	**123**
		0-0.5	6/6/2016	W3-2-SED-8.3-8.9	16-06-0655	66	**24400B**	<2.19	17.5	217	**0.71J**	<1.46	**101**	**20**	106	**48600**	60.8	**0.752**	<0.729	**114**	<2.19	1.28	<2.19	**75.4**	425	<30	<30	<30	<30	**130**	**89**	**110**	<30	**329**
	W3-02	1.5-2	3/7/2017	W3-2-SED-1.5-2.0	17-03-0683	58	**27200**	**1.43J**	**11.2**	123	**0.636**	**1.67**	**105**	**18.4**	**80**	**41100**	137	**1.06**	**1.53**	**106**	**1.63J**	**0.727**	<1.7	**79.5**	321	<23	<23	<23	<23	**200**	**200**	**150**	<23	550
		2.5-3	3/7/2017	W3-2-SED-2.5-3.0	17-03-0683	56	**32000**	**1.51J**	**12.3**	**71**	**0.723**	**1.65**	**115**	**20.6**	**75.7**	**45900**	67.9	**0.863**	<0.562	**108**	**0.929J**	1.38	<1.69	**88.7**	203	<23	<23	<23	<23	**34**	**47**	**48**	<23	**130**
		3.5-4	3/7/2017	W3-2-SED-3.5-4.0	17-03-0683	57	**35900**	<1.69	16.4	96	**0.818**	**2.37**	**132**	22.7	**87.5**	92000	77.2	**0.744**	**0.589**	**125**	<1.69	1.5	<1.69	89.1	317	<23	<23	<23	<23	**96**	**70**	**51**	<23	**220**
		4.5-5	3/7/2017	W3-2-SED-4.5-5.0	17-03-0683	53	**32100**	**0.333J**	**11.4**	86.4	**0.745**	**1.55**	**118**	**20.7**	**59**	**44800**	177	**1.22**	<0.505	**120**	**0.845J**	**0.725**	<1.51	**89.2**	221	<21	<21	<21	<21	**25**	**29**	**29**	<21	**83**
	W3-03	0-0.5	6/6/2016	W3-3-SED-21.2-21.8	16-06-0655	67	**22800B**	**1.62B,J**	**12.7**	**55.2**	**0.682J**	<1.46	**89.7**	**18.3**	**65.5**	**43600**	**41.5**	**0.389**	<0.730	**98.7**	<2.19	**0.752**	<2.19	**71.9**	202	<31	<31	<31	<31	**45**	**33**	**41**	<31	**119**
		0-0.5	6/6/2016	W3-4-SED-8.8-9.4	16-06-0655	70	**24000B**	**4.98B**	17.9	187	**0.703J**	<1.74	**93.5**	**18.9**	**76**	**45600**	**47.5**	**0.482**	<0.868	**104**	<2.60	1.01	<2.60	**74.8**	247	<34	<34	<34	<34	**56**	**40**	**39**	<34	**135**
		1.5-2	3/7/2017	W3-4-SED-1.5-2.0	17-03-0683	55	**33000**	**0.798J**	**12**	160	**0.733**	5.11	**146**	28.4	245	55100	167	**3.15**	**0.761**	**178**	**1.21J**	2.37	<1.63	**87**	787	<110	<110	<110	<110	**800**	**500**	**230**	<110	1500
	W3-04	2.5-3	3/7/2017	W3-4-SED-2.5-3.0	17-03-0683	57	**34400**	**3.01**	16.4	**75.6**	**0.819**	3.62	**136**	23.8	122	51300	74.8	**1.54**	<0.562	**136**	**1.21J**	2.11	<1.69	103	349	<23	<23	<23	<23	**120**	**85**	**59**	<23	**260**
		3.5-4	3/7/2017	W3-4-SED-3.5-4.0	17-03-0683	56	**28800**	**1.05J**	**10.9**	**70.7**	**0.643**	**2.46**	**108**	**19.1**	**76**	**40500**	77.4	**1.49**	**0.307J**	**107**	<1.67	1.19	<1.67	**81.3**	403	<22	<22	<22	<22	**120**	**76**	**50**	<22	**250**
		4.5-5	3/7/2017	W3-4-SED-4.5-5.0	17-03-0683	56	**27400**	**0.551J**	**12.7**	**71.5**	**0.712**	**1.97**	**112**	**20.2**	**79.5**	**42600**	74.5	**0.58**	<0.556	**109**	**1.35J**	1.49	<1.67	**85.4**	227	<22	<22	<22	<22	**96**	**79**	**79**	<22	**250**
		0-0.5	6/6/2016	W3-5-SED-15.0-15.5	16-06-0655	67	**26400B**	**2.14B,J**	20.8	86.9	**0.763**	**0.516J**	**116**	22.2	458	**62900**	216	**0.4**	**0.989**	**138**	<2.16	1.45	<2.16	**83.1**	768	<30	<30	<30	<30	**210**	**110**	**61**	<30	**381**
		1.5-2	3/17/2017	W3-5-SED-1.5-2.0	17-03-1483	55	**23900**	**7.41B**	16.4	235	**0.709**	6.23	203	85.8	688	80400	250	**0.611**	6.65	286	<1.71	1.11	<1.71	**86.7**	1620	<220	<220	<220	**2300**	<220	**1400**	**940**	<220	4600
	W3-05	2.5-3	3/17/2017	W3-5-SED-2.5-3.0	17-03-1483	54	**23900**	**<0.725**	14.9	**70.4**	**0.698**	**1.26**	**94.8**	**19.2**	**71.5**	**40700**	**47.8**	**0.4**	**0.64**	**94.6**	<1.68	**0.259J**	<1.68	**77.1**	215	<22	<22	<22	**130**	<22	**59**	**36**	<22	**230**
		3.5-4	3/17/2017	W3-5-SED-3.5-4.0	17-03-1483	55	**26100**	**2.71B**	13.6	**70.7**	**0.712**	**1.32**	**99.9**	**19.2**	**59.5**	**41500**	**40.3**	**0.547**	<0.554	**100**	<1.66	<0.554	<1.66	**79**	**165**	<22	<22	<22	<22	<22	<22	<22	<22	<22
		4.5-5	3/17/2017	W3-5-SED-4.5-5.0	17-03-1483	50	**24500**	**<0.721**	**10**	**59.2**	**0.669**	**0.616J**	**92.2**	**17.7**	**42.3**	**40700B**	**19.6**	**0.149J**	**0.698**	**91.5**	<1.5	<0.5	<1.5	**72.5**	**106**	<20	<20	<20	<20	<20	<20	<20	<20	<20
		0-0.5	6/6/2016	W3-6-SED-6.7-7.3	16-06-0655	70	**25100B**	**2.48B**	13.6	**65**	**0.747J**	<1.65	**98.5**	**19.6**	93.3	**47500**	**49.4**	**0.347**	<0.824	**109**	**1.31J**	**0.782J**	<2.47	**79**	273	<33	<33	<33	<33	**63**	**43**	**48**	<33	**154**
		1.5-2	3/7/2017	W3-6-SED-1.5-2.0	17-03-0683	53	**21100**	**8.41**	22.8	604	**0.579**	29.9	266	40.4	2150	149000	1040	**1.16**	19.6	**356**	**9.07**	47.8	<1.59	**64.1**	4240	<430	<430	<430	<430	**3500**	**3400**	**4900**	<430	**12000**
	W3-06	2.5-3	3/7/2017	W3-6-SED-2.5-3.0	17-03-0683	53	**27100**	<1.56	**12.5**	90.7	**0.65**	3.4	**123**	**20.3**	148	**46900**	138	**1.41**	**0.913**	306	<1.56	1.38	<1.56	**81.7**	395	<21	<21	<21	<21	**120**	**180**	**180**	<21	**480**
		3.5-4	3/7/2017	W3-6-SED-3.5-4.0	17-03-0683	56	**30100**	<1.62	**12.3**	**70.1**	**0.706**	**1.66**	**111**	**20.8**	**87.5**	**45100**	57	**2.44**	<0.541	**110**	<1.62	**0.668**	<1.62	**87.2**	242	<23	<23	<23	<23	**110**	**60**	**48**	<23	**220**
		4.5-5	3/7/2017	W3-6-SED-4.5-5.0	17-03-0683	54	**30900**	**3.52**	14.1	**80.1**	**0.754**	**1.65**	**115**	**21**	**75.4**	**45500**	58.4	**0.584**	<0.521	**115**	**1.04J**	0.868	<1.56	**90**	**200**	<22	<22	<22	<22	**120**	**170**	**170**	<22	470
		0-0.5	6/7/2016	W3-7-SED-0-0.5	16-06-0656	52	**18900B**	**9.64**	47.6	203	**0.487J**	5	760	38.7	2280	85500	312	**1.02**	19.3B	931	<1.63	1.16	<1.63	**73.9**	3340	<210	<210	<210	<210	**1500**	**650**	**360**	<210	2510
		1.5-2	6/7/2016	W3-7-SED-1.5-2	16-06-0656	63	**12500B**	**93.1**	68.9	1290	<1.34	103	264	25.6	3280	157000	3080	**1.58**	25.2B	959	<4.02	10	<4.02	**59.2**	6560	<270	<270	<270	<270	**920**	**2600**	**3100**	<270	6620
	W3-07	2-2.1	6/7/2016	W3-7-SED-2.0-2.1	16-06-0656	59	**12800B**	**30.6**	76	949	<1.15	34.2	305	32	621	164000	1650	**1.95**	20.9B	404	<3.46	2.45	<3.46	**70.9**	4270	<240	<240	<240	<240	**1100**	**2700**	**2400**	<240	6200
		3.5-4	3/17/2017	W3-7-SED-3.5-4.0	17-03-1483	56	**20900**	**2.85B**	15.5	118	**0.561J**	4.47	158	27.8	206	81600	189	**0.928**	9.61	**163**	<1.71	4.14	<1.71	**67.3**	629	<110	<110	<110	<110	**280**	**570**	**430**	<110	1300
		4.5-5	3/17/2017	W3-7-SED-4.5-5.0	17-03-1483	57	**24800**	<1.78	**13**	**78**	**0.676**	5.3	**126**	**20.4**	146	**42200**	100	**2.71**	**3.03**	**120**	<1.78	3.19	<1.78	**75.7**	375	<46	<46	<46	<46	**73**	**150**	**170**	<46	400
		0-0.5	6/7/2016	W3-8-SED-0-0.5	16-06-0656	60	**25100B**	<1.83	31.4	195	**0.662**	2.93	**128**	25.6	360	67800	217	**1.37**	**3.65B**	352	<1.83	0.894	<1.83	**82.2**	1940	<120	<120	<120	<120	**730**	**900**	**380**	<120	2010
		1.5-2	6/7/2016	W3-8-SED-1.5-2	16-06-0656	58	**21500B**	<1.79	42.2	247	**0.602**	9.75	176	29	594	79200	484	**1.15**	7.05B	237	<1.79	**0.773**	<1.79	**78.1**	5680	<240	<240	<240	<240	**1800**	**870**	**390**	<240	3060
	W3-08	2.5-3	6/7/2016	W3-8-SED-2.5-3	16-06-0656	53	**18700B**	<1.63	23.3	190	**0.538J**	5.63	**147**	25.6	349	57200	424	**1.69**	**2.82B**	292	<1.63	1.59	<1.63	**68.8**	1270	<21	<21	<21	<21	**200**	**150**	**140**	<21	490
		3.5-4	3/6/2017	W3-8-SED-3.5-4.0	17-03-0550	55	**27800**	<1.73	**11.8**	148	**0.612**	6.89	139	317	243	51600	148	**3.77**	**3.55**	349	**2.51**	2.4	<1.73	**78.5**	677	<110	<110	<110	<110	**440**	**540**	**630**	<110	1600
		4.5-5	3/6/2017	W3-8-SED-4.5-5.0	17-03-0550	53	**32100**	<1.61	**11.2**	**84**	**0.691**	2.85	**133**	**20.8**	99.4	**44100**	76.8	**3.15**	**0.315J**	**142**	<1.61	1.11	<1.61	**81.5**	271	<21	<21	<21	<21	**94**	**84**	**90**	<21	**270**
		0-0.5	6/7/2016	W3-9-SED-0-0.5	16-06-0656	54	**22100B**	<1.70	19.8	147	**0.622**	**2.29**	**126**	23.8	416	58700	277	**1.4**	**1.68B**	**161**	<1.70	**0.402J**	<1.70	**75.2**	1060	<22	<22	<22	<22	**95**	**84**	**190**	<22	**369**
		1.5-2	6/7/2016	W3-9-SED-1.5-2	16-06-0656	52	**19200B**	<1.58	14.8	**83.7**	**0.596**	**1.65**	**116**	**19.9**	146	**38100**	184	**2.69**	**0.444B,J**	**159**	<1.58	1.76	<1.58	**64.8**	248	<21	<21	<21	<21	**83**	**19J**	**39**	<21	**141**
	W3-09	2.5-3	6/7/2016	W3-9-SED-2.5-3	16-06-0656	54	**23000B**	<1.68	18.4	**62.7**	**0.648**	**1.49**	**120**	23.5	**80.5**	**41500**	70.6	**3.64**	<0.561	**164**	<1.68	1.58	<1.68	**73.7**	246	<22	<22	<22	<22	**47**	**63**	**71**	<22	**181**
		3.5-4	3/7/2017	W3-9-SED-3.5-4.0	17-03-0683	53	**30100**	<1.52	**10**	**60.3**	**0.684**	**1.22**	**106**	**20.4**	**52.6**	**44400**	**22.3**	**0.207**	<0.508	**106**	<1.52	<0.508	<1.52	**82.3**	**147**	<21	<21	<21	<21	**78**	**33**	**18J**	<21	**130**
		4.5-5	3/7/2017	W3-9-SED-4.5-5.0	17-03-0683	51	**27000**	**1.17J**	**7.4**	**53.4**	**0.619**	**0.782J**	**95.1**	**18.6**	**38.5**	**41100**	**16.3**	**0.149J**	<0.499	**95.1**	<1.5	<0.499	<1.5	**73.7**	**113**	<20	<20	<20	<20	**23**	**13J**	<20	<20	**37**
	W3-32	0-0.5	6/8/2016	W3-32-SED-27-27.5	16-06-0657	56	**26200**	**0.382J**	**10.4**	92	**0.748**	**0.804J**	**106**	**19.5**	**73.8**	**41900**	96.9	**0.375**	<0.569	**103**	<1.71	**0.288J**	**0.576J**	**74.8**	459	<23	<23	<23	<23	**30**	**45**	**41**	<23	**116**
	W3-33	0-0.5	6/9/2016	W3-33-SED-19.0-19.5	16-06-0863	58	**27400**	<1.89	**9.58**	**65.3**	**0.736**	**0.504J**	**97.9**	**19.2**	**68.2**	**43500**	**36.8**	**0.353**	<0.629	**99.3**	<1.89	**0.262J**	<1.89	**74**	**191**	<24	<24	<24	<24	**39**	**35**	**28**	<24	**102**
	W3-34	0-0.5	6/9/2016	W3-34-SED-21.5-22.0	16-06-0863	55	**22000**	<1.74	**6.78**	91.5	**0.681**	**0.593J**	**82.4**	**16.5**	534	**36800**	**41.2**	<0.181	**0.414J**	**88.5**	<1.74	**0.23J**	**0.512B,J**	**63.2**	228	<22	<22	<22	<22	**160**	**140**	**72**	<22	**372**
	W3-35	0-0.5	6/9/2016	W3-35-SED-11.4-11.9	16-06-0863	62	**25700**	<2.03	**9.02**	**61.7**	**0.696**	**0.58J**	**92.2**	**17.9**	**56.7**	**40900**	**34.7**	**0.374**	<0.677	**93.3**	<2.03	**0.417J**	<2.03	**68.9**	**163**	<26	<26	<26	<26	**21J**	**25J**	**26J**	<26	**72**
	W3-36	0-0.5	6/9/2016	W3-36-SED-9.4-9.9	16-06-0863	53	**24800**	<1.61	**9.7**	86	**0.713**	**0.974J**	**109**	**19.5**	**80.7**	**42100**	53.4	**0.531**	5.05	**142**	<1.61	**0.363J**	<1.61	**72.5**	266	<21	<21	<21	<21	**91**	**61**	**32**	<21	**184**
	W3-37	0-0.5	6/9/2016	W3-37-SED-8.3-8.8	16-06-0863	60	**26100**	<1.89	**9.57**	**73.5**	**0.75**	**0.692J**	**99.7**	**19.5**	**76.2**	**44300**	**44.4**	**0.529**	<0.63	**112**	<1.89	**0.356J**	<1.89	**74.4**	245	<24	<24	<24	<24	**82**	**75**	**37**	<24	**194**
		0-0.5	6/9/2016	W3-38-SED-5.4-5.9	16-06-0863	61	**24000**	<1.93	**6.89**	101	**0.676**	**0.872J**	**110**	**19.2**	**68.5**	**39600**	92.2	**0.855**	<0.644	**118**	<1.93	**0.262J**	<1.93	**69.1**	243	<25	<25	<25	<25	**100**	**96**	**69**	<25	**265**
		1.5-2	3/6/2017	W3-38-SED-1.5-2.0	17-03-0550	54	**27600**	**0.426J**	**9.03**	**64.8**	**0.604**	**1.05J**	**95.7**	**18.3**	**50.8**	**40600**	112	**0.284**	**0.416J**	**96.6**	**0.753J**	**0.322J**	<1.59	**73.1**	**169**	<22	<22	<22	<22	**49**	**51**	**92**	<22	**190**
	W3-38	2.5-3	3/6/2017	W3-38-SED-2.5-3.0	17-03-0550	52	**27800**	**51.1**	**8.23**	**66.7**	**0.619**	**1.63**	**96**	**18.1**	**45.3**	**39900**	58.3	**0.175J**	**0.417J**	**96.8**	**2.14**	<0.531	<1.59	**75.7**	574	<21	<21	<21	<21	**38**	**36**	**48**	<21	**120**
		3.5-4	3/6/2017	W3-38-SED-3.5-4.0	17-03-0550	50	**29700**	<1.52	**8.49**	**53.4**	**0.603**	**0.95J**	**94.8**	**18.4**	**83.6**	**40300**	72	**0.29**	<0.508	**92.2**	**0.821J**	<0.508	<1.52	**74.9**	**104**	<20	<20	<20	<20	**30**	**20**	**24**	<20	**75**
		4.5-5	3/6/2017	W3-38-SED-4.5-5.0	17-03-0550	49	**26600**	<1.42	**6.59**	**55.6**	**0.583**	**0.792J**	**111**	**17.6**	**37.7**	**38700**	**27.6**	**0.127J**	**0.342J**	**91.9**	**1.34J**	<0.473	<1.42	**69.8**	**159**	<20	<20	<20	<20	**21**	**31**	**82**	<20	**130**
		0-0.5	6/9/2016	W3-39-SED-5.0-5.5	16-06-0863	63	**25900**	<2.04	**7.68**	**67.1**	**0.759**	**0.502J**	**103**	**18.9**	**67.8**	**42900**	**40.4**	**0.0613J**	<0.681	**107**	<2.04	**0.455J**	<2.04	**74.8**	**200**	<27	<27	<27	<27	**34**	**45**	**28**	<27	**107**
		1.5-2	3/6/2017	W3-39-SED-1.5-2.0	17-03-0550	56	**31800**	<1.66	**12.3**	97.1	**0.689**	**1.97**	**117**	**20**	**72.7**	**43900**	78.4	**0.786**	<0.553	**116**	<1.66	0.86	<1.66	**86.3**	233	<23	<23	<23	<23	**150**	**140**	**170**	<23	**460**
	W3-39	2.5-3	3/6/2017	W3-39-SED-2.5-3.0	17-03-0550	56	**30400**	<1.67	**13.7**	**72.2**	**0.659**	**1.34**	**105**	**19**	**71.8**	**41500**	55.2	**0.589**	<0.558	**105**	<1.67	0.854	<1.67	**81.9**	**188**	<23	<23	<23	<23	**41**	**54**	**64**	<23	**160**
		3.5-4	3/6/2017	W3-39-SED-3.5-4.0	17-03-0550	52	**26900**	<1.53	**9.09**	**56.5**	**0.586**	**1.07**	**92.8**	**16.7**	**47.1**	**38700**	74.3	**0.537**	**0.407J**	**89.6**	<1.53	<0.51	<1.53	**72.1**	**122**	<21	<21	<21	<21	**23**	**24**	**80**	<21	**130**
		4.5-5	3/6/2017	W3-39-SED-4.5-5.0	17-03-0550	53	**29200**	**0.635J**	**12.3**	**62.9**	**0.619**	**1.07**	**97.7**	**17.7**	**89.9**	**40300**	60.5	**0.381**	**0.383J**	**94.8**	**1.27J**	**0.189J**	<1.6	**77.4**	**160**	<21	<21	<21	<21	**19J**	**25**	**33**	<21	**77**

Table 6b
Sediment Sample Analytical Results - Project Area, Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

terraphase engineering

							Metals																				PCBs								
						Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Total PCBs
					Screening Levels	%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
					95% UCL Subtidal Background	n/a	29122	--	9.63	66.19	0.693	0.926	105.7	17.23	61.3	42506	35.39	3.077	2.689	110.7	--	0.501	--	75.27	156.5	--	--	--	--	--	--	--	--	157.1
					95% UTL Subtidal Background	n/a	37789	--	13.37	84.69	0.852	2.79	157	21.3	90.98	48900	51.68	4.958	5.01	178	--	0.905	--	90.11	230.1	--	--	--	--	--	--	--	--	--	395
Sample Type	Location	Sample Depth (ft)	Sample Date	Field ID	SDG																													
Subtidal	W3-40	0-0.5	6/9/2016	W3-40-SED-4.7-5.2	16-06-0863	62	**25400**	<1.96	**7.93**	**81**	**0.707**	**0.823J**	**106**	**18.8**	**77.8**	**42500**	154	**0.616**	<0.653	**110**	<1.96	**0.258J**	<1.96	**70.6**	230	<26	<26	<26	<26	**240**	**100**	**52**	<26	**392**
		1.5-2	3/8/2017	W3-40-SED-1.5-2.0	17-03-0770	58	**22800**	<1.72	13.4	123	**0.604**	2.92	**111**	20.6	167	**41400B**	132	**0.901**	**1.12**	**112**	**2.74**	1.22	<1.72	**73.4**	413	<24	<24	<24	<24	**170**	**200**	**160**	<24	530
		2.5-3	3/8/2017	W3-40-SED-2.5-3.0	17-03-0770	56	**22900**	<1.63	**10.3**	**51.8**	**0.576**	**1.74**	**90**	**18.5**	**49.9**	**39100B**	**33.5**	**0.318**	**0.765**	**92.3**	**4.66**	**0.218J**	<1.63	**69.4**	**140**	<22	<22	<22	<22	**82**	**77**	**58**	<22	**220**
		3.5-4	3/8/2017	W3-40-SED-3.5-4.0	17-03-0770	52	**22900**	<1.6	**8.04**	**59.2**	**0.574**	**1.38**	**86.2**	**18**	**41.3**	**37700B**	**32.2**	**0.149J**	**0.417J**	**88.5**	**5**	<0.533	<1.6	**68.3**	**137**	<21	<21	<21	<21	**19J**	**16J**	**41**	<21	**76**
		4.5-5	3/8/2017	W3-40-SED-4.5-5.0	17-03-0770	50	**20800**	<1.45	**7**	**65.2**	**0.53**	**1.27**	**78.5**	**16.9**	**34.4**	**36100B**	91.1	**0.0972J**	<0.483	**81.4**	**4.01**	<0.483	<1.45	**62.8**	**120**	<20	<20	<20	<20	<20	<20	**13J**	<20	<20
	W3-41	0-0.5	6/9/2016	W3-41-SED-9.2-9.7	16-06-0863	61	**21200B**	<1.98	15.8	132	**0.581J**	3.49	**149**	23.4	458	**8040GB**	2240	**0.434**	**3.99**	**160**	<1.98	3.8	<1.98	**71.3**	17GB	<26	<26	<26	<26	**450**	**270**	**270**	<26	990
		1.5-2	3/10/2017	W3-41-SED-1.5-2.0	17-03-1005	53	**22600**	<1.58	17.7	196	**0.451J**	9.84	268	33.8	1870	**11600B**	1220	**0.834**	35.4	268	**5.27**	1.29	<1.58	**75.4**	311GB	<210	<210	<210	**3200**	<210	**2000**	**660**	<210	**5900**
		2.5-3	3/10/2017	W3-41-SED-2.5-3.0	17-03-1005	52	**24600**	<1.52	18	191	**0.606**	6.06	**133**	30.4	340	**6020GB**	186	**0.894**	**1.97**	207	**2.08**	1.33	<1.52	**76.6**	121GB	<100	<100	<100	**550**	<100	**460**	**290**	<100	**1300**
		3.5-4	3/10/2017	W3-41-SED-3.5-4.0	17-03-1005	55	**27700**	<1.62	**13.1**	**70.6**	**0.677**	**2.36**	**138**	**21.1**	1340	**46100B**	121	**0.569**	<0.541	**130**	**1.8**	**0.764**	<1.62	**83.2**	416B	<22	<22	<22	**260**	<22	**120**	**47**	<22	420
		4.5-5	3/10/2017	W3-41-SED-4.5-5.0	17-03-1005	56	**28700**	<1.66	13.6	**65.7**	**0.675**	**1.98**	**109**	**20.7**	**85.5**	**44900B**	58.8	**0.551**	<0.553	**117**	<1.66	**0.736**	<1.66	**83.4**	279B	<23	<23	<23	**240**	<23	**110**	**48**	<23	400
	W3-42	0-0.5	6/10/2016	W3-42-SED-17.2-17.7	16-06-0862	64	**27100B**	<2.00	**8.35**	**75**	**0.727**	**1.07J**	**104**	**18.2**	113	**44600B**	54.2	**0.309**	**0.884**	**106**	<2.00	<0.666	<2.00	**78.6**	334B	<28	<28	<28	<28	**140**	**76**	**65**	<28	**281**
	W3-43	0-0.5	6/13/2016	W3-43-SED-7.5-8.0	16-06-1303	64	**33900**	<2.01	20.2	173	**0.716**	**2.59**	159	**17.4**	511	**5840GB**	114	**0.443B**	6.91	**118**	<2.01	**0.309J**	<2.01	**84.5B**	780	<28	<28	<28	<28	**260**	**220**	**230**	<28	710
		1.5-2	3/10/2017	W3-43-SED-1.5-2.0	17-03-1005	55	**17000**	<1.67	15	136	<0.557	29.4	648	38.7	12000	**18600B**	702	16.6	56.7	3520	**10.9**	3.65	<1.67	**60.6**	1610GB	<220	<220	<220	**2500**	<220	**910**	**320**	<220	**3800**
	W3-44	0-0.5	6/13/2016	W3-44-SED-9.4-9.9	16-06-1303	65	**30000**	<2.14	17.3	117	**0.626J**	**0.741J**	**95**	**12.6**	117	**42800B**	63.8	**0.549B**	**4.52**	**96.3**	<2.14	**0.37J**	<2.14	**70.2B**	390	<28	<28	<28	<28	**210**	**130**	**120**	<28	460
		1.5-2	3/8/2017	W3-44-SED-1.5-2.0	17-03-0770	55	**19300**	<1.66	20.1	591	**0.411J**	21.4	199	25.8	789	**8070GB**	662	**1.87**	13.3	432	**8.85**	1.92	<1.66	**71.2**	3GB0	<450	<450	<450	<450	**3600**	**2700**	**1300**	<450	**7500**
		2.5-3	3/10/2017	W3-44-SED-2.5-3.0	17-03-1005	52	**18800**	**4.65**	18.5	639	**0.424J**	25.3	193	51.3	1460	**8970GB**	685	**2.13**	8.46	315	**4.14**	2.08	<1.52	**67.9**	3020B	<420	<420	<420	**1700**	<420	**2100**	**3500**	<420	**7200**
		3.5-4	3/10/2017	W3-44-SED-3.5-4.0	17-03-1005	53	**27200**	<1.61	**13.2**	105	**0.605**	4.61	**136**	21.7	119	**44800B**	112	**4.41**	**0.384J**	**148**	<1.61	2.71	<1.61	**77.1**	424B	<21	<21	<21	**190**	<21	**220**	**170**	<21	**580**
		4.5-5	3/10/2017	W3-44-SED-4.5-5.0	17-03-1005	52	**27500**	<1.54	**12.7**	97.8	**0.633**	3.26	**128**	**20.5**	127	**45100B**	87.1	**1.6**	**0.562**	**145**	**1.31J**	1.81	<1.54	**81**	383B	<21	<21	<21	**250**	<21	**150**	**97**	<21	**490**
	W3-45	0-0.5	6/13/2016	W3-45-SED-11.2-11.7	16-06-1303	64	**35200**	<2.13	15.2	95.1	**0.781**	**0.531J**	**108**	**14.4**	**89.1**	**47900B**	53.6	**0.876B**	**4.48**	**107**	<2.13	**0.439J**	<2.13	**80.1B**	275	<28	<28	<28	<28	**69**	**56**	**48**	<28	**173**
	W3-46	0-0.5	6/13/2016	W3-46-SED-10.8-11.3	16-06-1303	56	**22600**	<1.81	**7.81**	86.3	**0.598J**	**0.739J**	**87.7**	**17**	**73.2**	**38500**	**40.2**	**0.688**	<0.602	**96.3**	<1.81	**0.218J**	<1.81	**64**	232	<23	<23	<23	<23	**60**	**53**	**36**	<23	**149**
	W3-47	0-0.5	6/13/2016	W3-47-SED-5.1-5.6	16-06-1303	67	**37100**	<2.18	21.4	103	**0.754**	<1.46	**155**	**15.6**	1710	**6480GB**	63.3	**0.456B**	13.7	**131**	<2.18	<0.728	<2.18	**86.8B**	572	<30	<30	<30	<30	**200**	**96**	**60**	<30	**356**
		1.5-2	3/13/2017	W3-47-SED-1.5-2.0	17-03-1084	46	**14300**	**5.19**	18	276	**0.335J**	10.5	168	60.7	367	**7870GB**	533	**1.63**	9.98	248	<1.35	1.91	<1.35	**52.4**	1530	<180	<180	<180	<180	**550**	**880**	**590**	<180	**2000**
		2.5-3	3/13/2017	W3-47-SED-2.5-3.0	17-03-1084	56	**24300**	**2.93**	**12.3**	**83.4**	**0.603**	**2.43**	**152**	21.8	172	**5890GB**	91.6	**0.112J**	9.86	**138**	<1.66	<0.553	<1.66	**75.1**	403	<22	<22	<22	<22	**85**	**150**	**150**	<22	**390**
		3.5-4	3/13/2017	W3-47-SED-3.5-4.0	17-03-1084	50	**23800**	**2.37**	**7.44**	**45.8**	**0.594**	**0.917J**	**89.3**	**17.9**	**37.6**	**40100B**	**15**	**0.0844J**	**0.289J**	**100**	**0.923J**	<0.485	<1.45	**67.9**	**122**	<20	<20	<20	<20	<20	<20	<20	<20	<20
		4.5-5	3/13/2017	W3-47-SED-4.5-5.0	17-03-1084	51	**21400**	**0.731J**	**7.8**	**42.2**	**0.557**	**0.674J**	**79.7**	**16.6**	**32.9**	**36600B**	**12.1**	**0.0677J**	<0.51	**86.2**	<1.53	<0.51	<1.53	**61.9**	**115**	<20	<20	<20	<20	<20	<20	<20	<20	<20
	W3-48	0-0.5	6/10/2016	W3-48-SED-2.5-3.0	16-06-0862	59	**22500B**	<1.75	16.5	254	**0.607**	3.12	169	25	3120	**7850GB**	186	10.5	9.07	182	**2.17**	**0.779**	<1.75	**77.4**	2180B	<240	<240	<240	<240	**780**	**410**	**860**	<240	**2050**
		1.5-2	3/10/2017	W3-48-SED-1.5-2.0	17-03-1005	51	**19600**	<1.53	22.4	349	**0.37J**	15.3	235	38.2	1130	**12300B**	557	**1.1**	11.4	264	**10.5**	6.93	<1.53	**75.4**	5660B	<100	<100	<100	**1400**	<100	**630**	**200**	<100	**2200**
		2.5-3	3/10/2017	W3-48-SED-2.5-3.0	17-03-1005	48	**22000**	<1.47	**11.4**	187	**0.487J**	6.49	**129**	22.2	380	**6350GB**	209	**0.792**	**3.86**	**141**	**1.9**	**0.475J**	<1.47	**71.1**	1160B	<96	<96	<96	**1100**	<96	**560**	**280**	<96	**1900**
		3.5-4	3/10/2017	W3-48-SED-3.5-4.0	17-03-1005	52	**24700**	<1.53	**8.54**	**65.9**	**0.549**	**2.13**	**104**	**19.8**	**86.2**	**47600B**	**46.9**	**0.281**	**1.46**	**108**	**1.13J**	<0.511	<1.53	**73.2**	460B	<21	<21	<21	**270**	<21	**130**	**46**	<21	430
		4.5-5	3/10/2017	W3-48-SED-4.5-5.0	17-03-1005	51	**27100**	<1.55	**7.2**	**48.5**	**0.602**	**1.1**	**94.2**	**18.2**	**37.1**	**40900B**	**13.6**	**0.0825J**	<0.516	**95.8**	**1.12J**	<0.516	<1.55	**72.3**	**122B**	<20	<20	<20	**83**	<20	**20J**	**14J**	<20	**120**
	W3-49	0-0.5	6/10/2016	W3-49-SED-2.5-3.0	16-06-0862	63	**24900B**	<1.96	**12.1**	156	**0.665**	**2.38**	**115**	**20.4**	217	**5000GB**	103	**0.484**	**1.32**	**120**	<1.96	1.16	<1.96	**75.7**	650B	<27	<27	<27	<27	**250**	**180**	**130**	<27	**560**
		1.5-2	3/13/2017	W3-49-SED-1.5-2.0	17-03-1084	56	**23800**	<1.63	14.1	**80.7**	**0.656**	**2.24**	**104**	**19.8**	93.2	**42800B**	81.1	**1.62**	**0.494J**	111	<1.63	1.43	<1.63	**80.2**	290	<23	<23	<23	<23	**170**	**220**	**200**	<23	**590**
		2.5-3	3/13/2017	W3-49-SED-2.5-3.0	17-03-1084	52	**22600**	<1.52	16.4	**76.2**	**0.632**	**1.27**	**90.7**	**18**	**56.7**	**39300B**	84.3	**0.413**	<0.506	**94.1**	**0.788J**	**0.708**	<1.52	**75.5**	**174**	<21	<21	<21	<21	**37**	**28**	**35**	<21	**100**
		3.5-4	3/13/2017	W3-49-SED-3.5-4.0	17-03-1084	56	**22500**	<1.71	14.3	**61.7**	**0.637**	**1.29**	**88.5**	**19.1**	**59.9**	**39900B**	**43**	**0.379**	**0.441J**	**97.4**	<1.71	**0.348J**	<1.71	**76.2**	**163**	<22	<22	<22	<22	<22	<22	<22	<22	<23
		4.5-5	3/13/2017	W3-49-SED-4.5-5.0	17-03-1084	56	**24000**	**1.06J**	**11.9**	**59.3**	**0.628**	**1.21**	**90.1**	**17.9**	**53.3**	**38600B**	**41.9**	**0.366**	<0.542	**95.6**	<1.63	**0.348J**	<1.63	**73.2**	**165**	<22	<22	<22	<22	<22	<22	<22	<22	<23
	W3-50	0-0.5	6/13/2016	W3-50-SED-7.6-8.1	16-06-1303	58	**21500**	<1.71	**11.7**	152	**0.615**	**1.22**	**115**	**20**	237	**44400**	103	**0.371**	**1.63**	**121**	<1.71	**0.476J**	<1.71	**66.6**	591	<24	<24	<24	<24	**430**	**260**	**110**	<24	**800**
		1.5-2	3/8/2017	W3-50-SED-1.5-2.0	17-03-0770	52	**19900**	<1.48	**6.02**	**40.7**	**0.538**	**1.17**	**80**	**16.7**	**35.5**	**34900B**	**11.6**	**0.612**	**0.29J**	**84**	**2.63**	<0.494	<1.48	**60.6**	**92.8**	<21	<21	<21	<21	**27**	**18J**	<21	<21	**46**
		2.5-3	3/8/2017	W3-50-SED-2.5-3.0	17-03-0770	49	**22800**	<1.49	**7.47**	**42.6**	**0.575**	**1.23**	**87.3**	**18.2**	**34.9**	**38000B**	**11.1**	**0.0657J**	<0.497	**89.3**	**3.65**	<0.497	<1.49	**67.7**	**91.5**	<20	<20	<20	<20	<20	<20	<20	<20	<20
		3.5-4	3/8/2017	W3-50-SED-3.5-4.0	17-03-0770	50	**21700**	<1.45	**7.24**	**43**	**0.57**	**1.16**	**84**	**17.4**	**33**	**36500B**	**12.1**	**0.0788J**	<0.483	**85.8**	**3.09**	<0.483	<1.45	**64.8**	**88**	<20	<20	<20	<20	<20	<20	<20	<20	<20
		4.5-5	3/8/2017	W3-50-SED-4.5-5.0	17-03-0770	50	**23400**	<1.43	20.3	**45.3**	**0.602**	**1.4**	**96**	26	**51**	**41100B**	**11.5**	**0.0651J**	**0.488**	**108**	**2.84**	<0.477	<1.43	**70.8**	**96.7**	<20	<20	<20	<20	**13J**	<20	<20	<20	<20
	W3-51	0-0.5	6/13/2016	W3-51-SED-13.0-13.5	16-06-1303	64	**19800**	<2.14	**7.18**	**64.7**	**0.611J**	**0.701J**	**79.6**	**20.8**	**58.6**	**35200**	**33.9**	**0.379**	<0.714	**91.6**	<2.14	<0.714	<2.14	**61.4**	**173**	<27	<27	<27	<27	**37**	**38**	**32**	<27	**107**
	W3-52	0-0.5	6/13/2016	W3-52-SED-8.0-8.5	16-06-1303	59	**22900**	<1.87	**8.93**	**72.4**	**0.642**	**0.734J**	**90.5**	**17.3**	**68**	**37200**	**44.5**	**0.252**	<0.624	**97.2**	<1.87	**0.269J**	<1.87	**66**	227	<24	<24	<24	<24	**61**	**73**	**40**	<24	**174**
		1.5-2	3/16/2017	W3-52-SED-1.5-2.0	17-03-1483	55	**26000**	**2.03B**	**12.8**	**78.2**	**0.722**	**1.82**	**125**	**19.9**	**70.7**	**39800**	95	**1.6**	<0.546	**142**	<1.64	1.21	<1.64	**79.5**	**197**	<22	<22	<22	<22	**32**	**53**	**55**	<22	**140**
		2.5-3	3/16/2017	W3-52-SED-2.5-3.0	17-03-1483	57	**27300**	**2.63B**	**12.9**	**68.9**	**0.741**	**1.37**	**105**	**19.3**	**66.7**	**42200**	**38.5**	**0.55**	<0.615	**99.6**	<1.84	1.22	<1.84	**82.3**	**189**	<23	<23	<23	<23	**15J**	**23J**	**26**	<23	**64**
		3.5-4	3/16/2017	W3-52-SED-3.5-4.0	17-03-1483	55	**26500**	**2.33B**	**12.1**	**73.6**	**0.707**	**1.28**	**102**	**18.9**	**63.8**	**41600**	**52.7**	**0.558**	<0.571	**102**	<1.71	1	<1.71	**79.6**	**173**	<22	<22	<22	<22	**27**	**39**	**46**	<22	**110**
		4.5-5	3/16/2017	W3-52-SED-4.5-5.0	17-03-1483	55	**25400**	**2.9B**	14.4	**62.2**	**0.738**	**1.07J**	**98.5**	**19.5**	**58.7**	**41700**	**48.5**	**0.418**	<0.564	**98.6**	<1.69	**0.358J**	<1.69	**81.2**	**159**	<22	<22	<22	<22	<22	**14J**	<22	<22	
	W3-53	0-0.5	3/16/2017	W3-53-SED-0-0.5	17-03-1483	70	**23600**	**2.78B**	**8.54**	**65.5**	**0.685J**	**0.796J**	**93.4**	**18**	**61.4**	**39900**	**37**	**0.371**	<0.802	**94.8**	<2.41	**0.507J**	<2.41	**68**	**180**	<33	<33	<33	<33	**77**	**59**	**52**	<33	**190**
	W3-54	0-0.5	3/16/2017	W3-54-SED-0-0.5	17-03-1483	67	**20700**	**3.18B**	**7.35**	**69.8**	**0.559J**	**0.676J**	**78.9**	**15.5**	**54.5**	**34200**	**32.6**	**0.16J**	<0.798	**79.8**	<2.39	<0.798	<2.39	**57.9**	**166**	<30	<30	<30	<30	**69**	**58**	**60**	<30	**190**
	W3-55	0-0.5	3/8/2017	W3-55-SED-0-0.5	17-03-0770	69	**23700**	<2.33	**7.79**	**78.9**	**0.633J**	**1.55J**	**87.6**	**17.7**	**55.2**	**38900B**	94.8	**0.334**	**0.605J**	**87.3**	**2.62**	**0.437J**	<2.33	**71.4**	**172**	<33	<33	<33	<33	<33	**30J**	**31J**	<33	**61**
	W3-56	0-0.5	3/8/2017	W3-56-SED-0-0.5	17-03-0770	66	**22800**	<2.11	**9.66**	**82.2**	**0.611J**	**1.76**	**92.7**	**20.3**	**68.6**	**40400B**	82.8	**0.421**	<0.703	**94.1**	**1.98J**	**0.553J**	<2.11	**69.5**	218	<29	<29	<29	<29	**60**	**88**	**64**	<29	**210**
	W3-57	0-0.5	3/8/2017	W3-57-SED-0-0.5	17-03-0770	69	**24500**	<2.46	**8.34**	87.9	**0.632J**	**1.47J**	**103**	**19.9**	**61.6**	**42300B**	**43.5**	**1.74**	<0.821	**107**	**3.32**	**0.3J**	<2.46	**72.3**	**183**	<33	<33	<33	<33	**44**	**96**	**91**	<33	**230**

Table 6b
Sediment Sample Analytical Results - Project Area, Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

							Metals																				PCBs								
							Moisture	Aluminum	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium (III+VI)	Cobalt	Copper	Iron	Lead	Mercury	Molybdenum	Nickel	Selenium	Silver	Thallium	Vanadium	Zinc	Aroclor 1016	Aroclor 1221	Aroclor 1232	Aroclor 1242	Aroclor 1248	Aroclor 1254	Aroclor 1260	Aroclor 1262	Total PCBs
				Screening Levels			%	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg	µg/kg
				95% UCL Subtidal Background			n/a	29122	--	9.63	66.19	0.693	0.926	105.7	17.23	61.3	42506	35.39	3.077	2.689	110.7	--	0.501	--	75.27	156.5	--	--	--	--	--	--	--	--	157.1
				95% UTL Subtidal Background			n/a	37789	--	13.37	84.69	0.852	2.79	157	21.3	90.98	48900	51.68	4.958	5.61	178	--	0.935	--	90.11	230.1	--	--	--	--	--	--	--	--	395
Sample Type	Location	Sample Depth (ft)	Sample Date	Field ID	SDG																													

Notes:

Sample depths are shown in feet below sediment suface
-- = insufficient data points for statistical calculations
< = analyte not detected above laboratory reporting limit
B = analyte was present in an associated method blank
Detected concentrations are **bold**
Bold colored concentrations are in exceedance of their corresponding screening level (shown at top)
J = estimated below laboratory reporting limit
mg/kg = milligrams per kilogram
n/a = not applicable
PCB = polychlorinated biphenyls
SDG = sample delivery group
Total PCBs summations from Aroclors were calculated using 0 for non-detects
µg/kg = micrograms per kilogram
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 7a
Statistical Evaluation – Project Area, Riprap Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

terraphase engineering

			Number Samples	Number Detects	Min	Max	Mean	Median	St Dev	95% UCL Concentration Background	95% UTL Concentration Background
Metals	Aluminum	mg/kg	23	23	7320	28600	17629	16900	6160	19834	31970
	Antimony	mg/kg	23	11	0.507	22.3	5.3	1.1	6.4	7.614	20.1
	Arsenic	mg/kg	23	23	9.23	158	45	23.4	41	71.28	139.9
	Barium	mg/kg	23	23	80.1	778	303	219	216	380.4	806.5
	Beryllium	mg/kg	23	18	0.317	0.742	0.48	0.45	0.17	0.567	0.85
	Cadmium	mg/kg	23	23	0.555	17.4	5.3	3.51	4.6	6.905	15.97
	Chromium	mg/kg	23	23	92.1	488	187	155	108	228.9	438.2
	Cobalt	mg/kg	23	23	18.3	73.8	35	31	16	41.51	72.12
	Copper	mg/kg	23	23	68.2	3970	1269	981	1184	1960	4025
	Iron	mg/kg	23	23	37500	199000	98174	74800	56664	123306	230088
	Lead	mg/kg	23	23	46.2	1820	613	469	560	925.2	1917
	Mercury	mg/kg	23	23	0.323	4.19	1.4	0.798	1.2	1.878	4.058
	Molybdenum	mg/kg	23	22	0.764	42.7	14	7.55	13	26.19	44.07
	Nickel	mg/kg	23	23	98.7	705	304	218	212	400.6	797
	Selenium	mg/kg	23	9	1.12	4.3	1.4	1.02	0.88	1.859	3.314
	Silver	mg/kg	23	23	0.345	6	2	1.28	1.7	2.762	5.903
	Thallium	mg/kg	23	2	0.922	1.13	0.88	0.865	0.17	NC	NC
	Vanadium	mg/kg	23	23	44.2	97.8	68	68.4	13	72.99	98.85
	Zinc	mg/kg	23	23	232	28500	5330	3120	7093	8605	21843
PCBs	Total PCBs	µg/kg	23	23	153	7760	2608	1670	2326	3890	8024

Notes:
mg/kg = miligrams per kilogram
µg/kg = micrograms per kilogram
Metals = Title 22 Metals, aluminum, iron
NC = not calculated
PCB = polychlorinated biphenyls
St Dev = standard deviation
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 7b
Statistical Evaluation – Project Area, Subtidal Locations
Sediment Investigation Report
Sims Metal Management, Redwood City, California

			Number Samples	Number Detects	Min	Max	Mean	Median	St Dev	95% UCL Concentration Background	95% UTL Concentration Background
Metals	Aluminum	mg/kg	104	104	12500	37100	24981	24550	4508	25715	33625
	Antimony	mg/kg	104	37	0.333	93.1	3.1	0.9	11.0	5.066	23.39
	Arsenic	mg/kg	104	104	6.02	76	14	12.3	10	16.22	34.28
	Barium	mg/kg	104	104	40.7	1290	139	80.4	180	216	484.8
	Beryllium	mg/kg	104	101	0.335	0.819	0.64	0.6365	0.095	0.654	0.811
	Cadmium	mg/kg	104	98	0.502	103	4.5	1.48	12	9.475	26.51
	Chromium	mg/kg	104	104	78.5	780	131	107	91	146.4	305.7
	Cobalt	mg/kg	104	104	12.6	317	25	19.8	30	30.55	83.43
	Copper	mg/kg	104	104	32.9	12000	422	80.25	1291	973.8	2898
	Iron	mg/kg	104	104	34200	186000	53460	42850	27529	58072	106244
	Lead	mg/kg	104	104	11.1	3080	200	65.85	430	383.3	1024
	Mercury	mg/kg	104	103	0.0613	16.6	1.1	0.5505	2	1.965	4.922
	Molybdenum	mg/kg	104	59	0.289	56.7	3.4	0.413	7.8	6.773	18.31
	Nickel	mg/kg	104	104	79.8	3520	187	109	356	339.1	869.6
	Selenium	mg/kg	104	40	0.753	10.9	1.7	0.985	1.9	2.127	5.364
	Silver	mg/kg	104	81	0.189	47.8	1.5	0.688	4.8	2.43	10.68
	Thallium	mg/kg	104	2	0.512	0.576	0.89	0.835	0.2	NC	NC
	Vanadium	mg/kg	104	104	52.4	101	75	74.8	8.2	76.13	90.6
	Zinc	mg/kg	104	104	88	10100	829	249	1539	1487	3780
PCBs	Total PCBs	µg/kg	104	93	37	12000	916	225	1896	1728	4533

Notes:
mg/kg = miligrams per kilogram
µg/kg = micrograms per kilogram
Metals = Title 22 Metals, aluminum, iron
NC = not calculated
PCB = polychlorinated biphenyls
St Dev = standard deviation
UCL = upper confidence limit
UTL = upper tolerance limit
95% UCL = 95-percent upper confidence limit on the mean
95% UTL = 95-percent upper tolerance limit on the mean
UCL & UTL calculated using ProUCL 5.0.00 Statistical Software for Environmental Applications for Data Sets with and without Nondetect Observations

Table 8
Reference Area PCB Data
Sims Metal Management, Redwood City, California

Reference Area	Number of Samples	Number of NDs	Min	Max	SD	Mean	95% UCL	90th Percentile 90% UTL (2015 Ambient Value)	99th Percentile 90% UTL[1]
USACE Redwood Creek, 2014[2] (-32.0 to -32.5-Z)	12	0	43	356	93.03	126.9	197	--	--
USACE Redwood Creek, 2015[3] (-30.0 to -30.5-Z)	12	0	2.09	30.1	7.219	13.64	17.39	--	--
USACE Redwood Creek, 2015[3] (-31.0 to -31.5-Z)	12	0	4.56	28.3	7.241	15.26	19.01	--	--
USACE Redwood Creek, 2015[3] (-32.0 to -32.5-Z)	12	0	1.22	132.4	38.43	37.68	73.61	--	--
San Francisco Bay Area Sediments calculated from data between 2002 and 2014[4]	--	--	--	--	--	--	N/A	18.2	29.5

Notes:
PCB = polychlorinated biphenyls
PCB concentrations in micrograms per kilogram (µg/kg)
Total PCB from summation of PCB congeners
-- not calculated
1 = 99th percentile required only for PCBs. Indicates approximate (non-outlier) upper limit for other constituents
2 = United States of Army Corp. of Engineers (USACE), San Francisco District. 2015. Redwood City Harbor Navigation Improvement Feasibility Report and Integrated EIS/EIR. HydroPlan LLC, in collaboration with GAIA and Moffatt and Nichol
3 = Data provide by United States Environmental Protection Agency staff during meeting with Sims and Terraphase representatives on March 8, 2016
4 = San Francisco Estuary Institute (SFEI). 2016. Technical Memorandum, Updated Ambient Concentrations of Toxic Chemicals in the San Francisco Bay Area Sediments
(-30.0 to -30.5-Z) = sample depth shown as elevation relative to Mean Lower Low Water